The Builder.

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*The Autobiography of John Gibson, Sculptor.**

FOR the same reason that sculptors should judge a sculptor's work it seems to us those who write of sculpture or sculptors should be sculptors too; if not by profession, by taste and natural feeling. The practice of the art is so removed from everyday life and experiences, and leads those who follow it so far beyond the threshold of the antique world, that sympathy with the modern one, doubtless, becomes more and more difficult, as proficiency is gained. Hence, we are bound to judge a sculptor as one whose art takes his thoughts into a different sphere of action to that in which most of us live. We were glad, therefore, to learn, that Mr. John Gibson did not leave his biography to accidental authorship, but drew up a sketch of the chief events of his life; and that this outline was to be placed in the hands of the public, edited by Lady Eastlake.

This autobiography is now published. We confess we are disappointed with the work. Perhaps one reason of this disappointment is the fact that Lady Eastlake claims so much for the sculptor, and makes out so little that is really in his favour, save negative qualities. Throughout life Gibson appears to have been the recipient of constant kindness from friend after friend. While still serving his apprenticeship at Liverpool, he was noticed by Mr. Roscoe, invited to his house, and privileged to make use of his superb collections; and directly he arrived in Rome, with the aid of his Liverpool friends, he was received with open arms by Canova. "I am rich," said he; "I am anxious to be of use to you, and to forward you in your art as long as you stay in Rome." Now, with the single exception of Miss Hosmer, the editress has failed to show that Gibson ever aided, or was the means of bringing out, any English artist or foreigner during his forty-eight years' residence in Rome, in return for this supreme obligation. He may have done so; but Lady Eastlake has not seen the responsibility of the payment of such a debt sufficiently vividly to make a point of recording it. Again, his editress claims for the sculptor that he was so above all money-getting considerations that he did not make *replicas* of his subjects. She remarks, "He might have done as other sculptors did, and do (at least, in Rome), and have kept a supply of *replicas* of his most popular works all ready in his studio, for sale to those who like to come, to see, and to carry away,—such *replicas* representing literally so much ready money to a sculptor of established fame. But Gibson refrained from such practices." But when we turn to a list of his works we see *replicas* of most of them were sold by him. The instances in which he made no repetition of a popular work were the exceptions, and not by any means the rule. He made eight repetitions of his "Cupid disguised as a Shepherd" after he had finished the original; four copies of his Venus; three of his Narcissus; three of his "Hunter and Dog," and a fourth was unfinished in his studio at the time of his death; two of his Pandora; two of his Hebe; two of his "Sleeping Shepherd Boy"; and single repetitions of several others. Lady Eastlake mentions, too, that Gibson's employer in Liverpool, Mr. Francis, sold several of the former's works under his own name; thus several pieces of sculpture are to be seen in that neighbourhood that were in reality the work of Gibson, though now assigned to Francis; but she omits to state that in the galleried sheds forming the sculptor's studio in La Via Fontanella, there was a staff of *Giovanne* and *formatore* that must have numbered from twenty to thirty members, some of whom probably furnished him the like clever assistance. One of them, Nucci, has since executed the figures for one of the sculptured chimney-pieces in Alnwick Castle, illustrated in the *Builder*,—consequently must have been an adept in his art; and during Gibson's annual long absences from Rome, after he became unable to bear the heat, these assistants must have made much progress without him. Yet she does not hint at the existence of such an establishment, except in one line, where, dwelling on his generosity, she says, "he paid his men not only liberally, but lavishly, making them frequent presents." Nor does the editress make her case good when, to prove the beautiful sincerity and "guileless simplicity" of her subject, she quotes a passage from one of his letters to this effect: "The sons of Adam are very bad animals: the beasts would be as bad as Christians if they could speak." This opinion from one who had been encouraged so kindly by Roscoe, and received such warm welcome and long teaching from Canova, not to bring in other instances in which he was the object of unaccountable assistance and lavish patronage beyond those already mentioned, certainly does not sound well. "Write me as one who loves his fellow-men," cried Abou Ben Adhem to the angel writing in the book of gold. A second thought on the part of Lady Eastlake, we are sure, would have caused her to give a less questionable illustration of Gibson amiability.

"If you are to be a sculptor," Mr. Roscoe used to say to Gibson, as he was showing him the contents of his portfolios in his library, on his weekly visits to Allerton, "I must remind you there is but one road to excellence, and that is the road trodden for you by the Greeks, who carried the art to the highest perfection. Michelangelo, with all his powerful genius, missed the purity of the Greeks. But it is their principles established from nature that you should endeavour to imbibe." Gibson took this road, so clearly pointed out, kept to it, turned neither to the right nor to the left, and attained excellence, celebrity, and fortune. It was smooth and rendered pleasant by prompt recognitions as he went, as well as by the beautiful ideal who tripped before him. He wrote to Mrs. Sandbach, the granddaughter of Mr. Roscoe, in 1842,—"In my art, what do I feel? what do I encounter? Happiness, love which does not depress me, difficulties which I do not fear, resolutions which never abate, flights which carry me above the crowd, ambition which tramples no one down." And so he travelled onwards, with scarcely more encumbrance than the Greek hat and little cloak with which Cupid was disguised as a shepherd; for he lived and died a bachelor.

The autobiography, curiously, begins with an inaccuracy, which Lady Eastlake corrects in a note. Gibson states he was born at Conway, which is famous for the beauty of its scenery; whereas it was a little hamlet, Gyffin, near that place, that was in reality his birthplace, though his mother and father soon after removed to Conway. They all spoke Welsh; and thought speaking English a very laborious business. But as they afterwards removed to Liverpool, intending to take passages there for the United States, which intention, however, was subsequently relinquished, English must have ultimately become less foreign to their tongues. The sculptor relates that when his mother, who was a very earnest, passionate, strong-minded woman, saw the great ships in the docks, she formed the most determined resolution never to put her foot in one of them; and as her will ruled the family, the plan of emigrating was given up. Gibson was put to school in the great mercantile city, where he got into trouble with his master, and favour with his fellow-scholars, for drawing, instead of attending to his lessons. But his good luck predominated even in these early days, for the stationer of whom he bought his materials lent him drawings to copy, talked to him of the Academy, and, generally, gave him ideas that he could not have picked up in his little Welsh home-circle. Then he was apprenticed to a firm of cabinet-makers, who ultimately allowed him to cancel his indentures, and place himself with Mr. Francis. He had been but a few months employed in his workshop, when Mr. Roscoe visited it, to order a chimney-piece for his seat, Allerton; and his drawings and models being shown to that friend of art, his kind encouragement commenced. After this, to use a North-country phrase, Gibson never once looked behind him: all was progress with him. His route was pointed out, as we have seen; funds furnished him; and Liverpool, London, and Rome were only so many successive stages to the road that had been trodden by the Greeks; and his adoption of colour in later life was only carrying into effect his ingrained creed that "Whatever the Greeks did was right." Friendly hands were held out to him in many directions, as we have said, from the first. Dr. Vose instructed him in anatomy gratuitously; the family of Mr. Solomon D'Aguilar cultivated his mind; John Kemble sat to him; and Mrs. Siddons and Sir Thomas Lawrence lauded his work, and many copies of it were sold; in London, Mr. Christie, the auctioneer, introduced him to fresh supporters. Fuseli, West, and Flaxman all gave him the strongest encouragement. Flaxman confirmed him in his desire to go to Rome; but Chantrey disapproved of it, saying there was everything in London requisite for the education of a sculptor. Arrived in Rome, Canova received him as a pupil, giving him instruction for five years; and Thorwaldsen greeted him as a friend, and whenever Gibson modelled a new work came to him and corrected whatever was amiss. Canova advised him to study the Greeks, and to frequent the studios of the other sculptors, "and especially go as often as you can to that of Thorwaldsen: he is a very great artist." This he was enabled to do by virtue of the custom of the sculptors in Rome to visit one another, criticising or admiring work in progress. By and by people came to view his work in like manner. He records first a visit from the Duke of Devonshire in 1819, who tapped at his door and told him Canova had sent him to see what he was about. We will quote Gibson's appreciation of this friendly custom:—

"One of the great advantages I subsequently enjoyed in Rome, was the listening to conversations on art, not only between Canova and Thorwaldsen, but between artists of talent from all countries. In Rome all the studios are open to each other, every man sees another's work, and holds free communion with him, giving and receiving advice, and carrying on the labour of art by a combination of minds. On my return to England, how surprised was I to find that none of the sculptors visit each other in this way, nor does one sculptor consult another in the process of a work. This isolation is one reason, I believe, for the errors in public works, though some of them show talent and power. To advance sculpture in England, it is necessary that the artists should come in contact with each other, and also, if possible, with artists from other countries."

Lady Eastlake arrests the progress of the narrative, to insert letters that throw light upon various passages or elucidate views advanced by the author. Gibson's chief commissions, and the circumstances attending their acceptance and execution, are given. We need scarcely remind our readers that he executed

* Life of John Gibson, R.A., Sculptor. Edited by Lady Eastlake. London: Longmans, Green, & Co., 1870.

two statues of her Majesty, whose gracious way on the occasions of her sittings are recorded, and will be read with interest by many. He wrote to Mrs. Sandbach, December, 1846,—"Since my return to Rome, I have given myself up body and soul to finishing the Queen's statue, and have wrought her up as high as possible. My enthusiasm has also carried me beyond the practice of sculptors, for I have added colour. The diadem, sandals, and borders of drapery, are tinted with blue, red, and yellow. Since this statue has been finished, my studio has been constantly visited, and it makes a greater impression than the model did." A *replica* of this well-remembered statue was in some danger during the bombardment of Rome; but, during Gibson's absence from the scene of strife, the more martial Wyatt entered his studio, and caused a pent-house to be erected over the work, upon which the shells would have been harmless. An inundation of the Tiber, too, threatened it, without, however, any actual damage. Wyatt and Gibson worked together under Canova; lived for many years opposite to each other; and on the death of the former, we may add, our sculptor placed a monument to his memory. He performed this last tribute, too, to the memory of his brother Benjamin, who lived with him, in Rome, for some years, pursuing classical scholarship. Many such details are related in the narrative; but we must limit ourselves now to an indication of Gibson's impressions of the prospects of art in this country.

"Speaking from an experience of forty years' study and practice at Rome, where I had also the advantage of intercourse with the greatest artists, and most enlightened connoisseurs, I have come to the conviction that one great evil as regards the art in England arises from the class of committee to which the decision in such matters is intrusted. These committees are composed of miscellaneous individuals, united only in the common qualification of having no knowledge of or connexion with the art, beyond that which most educated individuals possess. . . . . At the Academy of St. Luke (in Rome) the system of competition for public monuments is condemned."

He would have every young sculptor repair to Rome and place himself under a great master, if he wished to become one. At the age of thirty, by this plan, he ought to be able to commence a work for posterity. And every committee appointed to judge such and all other sculpturesque works, he would have composed of sculptors, as now arranged at the Academy of St. Luke.

There is a profile outline of the sculptor given in the volume, taken from a bust modelled by Theed. But this, too, is disappointing;—not in its beauty, for it is beautiful; but the handsome youth, with the almost Greek features shown, is not the grey-headed artist of La Via Fontanella. Many persons interested in Gibson have carried away from his studio a remembrance of a quiet, almost languid, elderly, grey-bearded man, in a blouse; wan and worn, perhaps, with the creation of the groups of sculpture with which he was surrounded; and this portrait, fresh and youthful, breaks the thread of reminiscence.

THE ACCIDENT AT THE HOLBORN VIADUCT.

The fair and candid, if not exhaustive, report of Messrs. G. P. Bidder, T. E. Harrison, and E. Clark on the state of the Holborn Viaduct, was received, on the 16th inst., with great satisfaction by the members of the Improvement Committee of the Corporation of the City of London. That feeling will, to a certain extent, be shared by the public at large, and by men professionally interested in the science and art of the builder in particular. The unhesitating testimony borne, by men of such well-established reputation, to the solidity and safety of the foundations of the Viaduct, is matter for congratulation. We thought the matter, as a whole, more serious than they appear to do. We fear it is so still, but we are very glad to hear that they do not find it so. The investigation given by the reporters to the details of the setting of the columns, is, perhaps, from an engineering point of view, the most valuable feature of the report. Much has been said, and much written, on the subject, by more or less competent judges; the voices of the latter, as naturally constituting the majority, having for the most part prevailed. We have, for ourselves, delayed any detailed criticism of the misfortune since our announcement of the occurrence, on the ground that no such professional judgment was possible (otherwise than as a leap in the dark), without such a careful examination of the entire case as would be only within the competence of men professionally employed to report on its character. Careful examination of the drawings and working plans, determination of the weights, verification of the levels, perfect or otherwise, of the cornice and other main horizontal lines of the Viaduct, were, of course, indispensable. These points might, more or less fully, have been within the cognisance of not a few engineers. But with, and even above, all these requirements, the power of putting questions was indispensable to the cautious investigator. Not a byword to a labourer, or a hint snatched from a mason,—not even a courteous explanation from one of Mr. Haywood's staff, but that full information which can only be elicited by something like a judicial inquiry,—was a due preliminary to the process of making up one's mind. For this we felt that it was necessary to await the report which has now been issued.

Messrs. Bidder, Harrison, and Clark have presented us with a sort of abstract of their minutes of evidence. In this part of the report its main value to the profession consists. While the reporters have thus explained the reasons for the conclusions at which they have arrived, they have enabled us to push the inquiry somewhat further.

Explanations, the reporters tell us, have been furnished them by the engineer, by the two clerks of the works in charge during the construction, and by the mason who executed the works for the contractor. Careful examination of the viaduct itself, and of the plans and designs, combined with this oral explanation, has thus placed at the command of Mr. Bidder and his associates something of the history of the failure.

In one respect the reporters have omitted to give an item of information of no slight importance to a correct judgment of the case. The omission is the more remarkable as it does not appear, from any paragraph of the report, as if the attention of the reporters had specially been directed to one of the most critical points of the case. It is mentioned, quite incidentally, that the weight imposed on each column is about 180 tons. We conclude that the eight interior columns, in which the fractures occur, are thus indicated, and that the pressure on the four angular, or external, columns is only about half that weight, *plus* the extra weight of parapet, cornice, and footway. But an essential feature in the case is the distribution of this weight. Not only does the skew of the span—the angle at which the upper roadway crosses the lower one—throw the actual weight of the superstructure on a portion of the columns, leaving a large section of each to discharge a merely ornamental, if not injurious function; but the great difference between the span of the central and of the side arches is such as to throw a much larger part of the 180 tons upon the portion of the column facing the roadway (where the fractures occurred) than that which rests upon the opposite face of the granite hexagons.

It is unnecessary now to inquire what would have been the result of this uneven weighting of the columns had the mass of each been perfectly homogeneous, and the bed mechanically true. But, under the actual circumstances of the case, we have here, perhaps, the knot of the matter. Without denying that motion *may* have taken place from the effect of temperature, and that thus a rocking of the piers upon their bases may have increased the effect of a crushing, wedge-like action, we must yet observe that no evidence is afforded of the occurrence of such motion. The bolting of the central girders together by a vertical joint in the centre, like what masons call a she-arch, is probably more obnoxious to the mechanically trained eye than it is deserving of any more grave condemnation. Still, the behaviour of these joints is a point to which attention should have been directed.

But as to the fact that it is the effect of positive and ascertainable weight, rather than of possible and problematical motion, which has split the 13-in. stones, the bridge tells its own story. Let any one compare the state, almost or altogether uninjured, of the outer or less heavily weighted piers with that of those under the interior of the bridge, and he will see that weight has been the element of disintegration. The very close resemblance to one another of the form and position of the cracks in the inner columns struck us from the first moment as being one of the most remarkable features of the case, and it is one as to which the report in question enables the public to form a definite and positive opinion.

The 13-in. beds of Ross of Mull granite, in which the main fractures occurred, were fine-chiselled to a true bed for a depth from 1½ in. to 2 in. all round their periphery, the centres of the beds being left purposely hollow to an extent not exceeding one-eighth of an inch on each bed. Opposite each angle, and at a distance of 1 in. from the face, pieces of lead, weighing from 5 lb. to 7 lb. per foot, were placed, the interior of the bed being filled in with fine mason's putty. Thus the bearing surface of the column, instead of being that due to a hexagonal prism of 4 ft. diameter, was reduced to an interrupted ring of from ½ in. to 1 in. in width, and from 6 in. to 8 in. in length for each point of support. On the half of these points, which, speaking approximately, afforded a bearing surface of some 30 superficial inches, upwards of 130 tons, the weight of the half of the central arch and spandrels, directly pressed. On the equal area of bearing surface towards the footway less than fifty tons have to be supported. The granite prism thus resembled, at the points where it transmitted the weight of the superstructure to the subjacent plinth, a ring of piles firmly bound together, rather than a monolithic column. A tendency to cant the columns towards the roadway would be one result, but, even independent of this, the actual direct pressure on the angles immediately under the girder was too much for the stone. The regularity with which the fractures occurred in the interior columns seems thus accounted for.

It appears to us to be of much more importance thus definitely to point out the fact that a weight, perfectly manageable if distributed over the area of the column, became destructive when thrown by ill-judged setting upon half a dozen points, than to enter into the vexed question of expansion and contraction of the girders. On this point men capable of forming an opinion materially differ. All that has been said on this part of the subject has been the assertion of what the girders *must have* done theoretically. No observation of what they actually *do* or *did* has, so far as we can learn, been attempted. The referees speak of a maximum contraction in the width of the centre girder, due to the variation of temperature between the time of fixing and that at which the fracture was detected, amounting to a quarter of an inch. It is very curious that they omit to explain that on any other hypothesis than that the iron arch was a perfectly unyielding and non-elastic structure (which, of course, they would not contend to be the case), the effect of such contraction would be to lower the crown of the arch, and thus throw an increased pressure against the columns, the effect of which, if ascertainable, would have been on the side *opposite* to the actual fracture. We therefore think it is matter of regret that the vague nature of this part of the report tends to leave in some degree of obscurity an occurrence which is perfectly intelligible by the light of the very simplest laws of mechanics.

Another point on which the report is silent has not, we believe, been at all alluded to. On a visit to the Viaduct on the day on which the report was issued, a phenomenon became apparent which it is impossible to disregard. The upper line of roadway demands careful examination, no less than the state of the columns which support it. The beautifully regular surface which the pitching over the Viaduct presented a month ago will not now be found equally faultless. As far as variations of level are concerned, the change is not greater than—not, we think, so much as—we have often observed in newly-pitched roads upon *terra firma*; but that which is peculiar to the Viaduct road, and not only peculiar, but, to some extent at least new, is the appearance of a system of sharp, well-defined cracks, separating the setts, or pitching stones, from one another, and extending over the greater portion of the area covering the arch. On the occasion to which we refer, these cracks were as fresh and distinct as if they had been just formed. In very muddy weather they would probably not be perceptible, but on the morning of the 16th inst. there could be no doubt as to their presence.

What is the exact indication given by these cracks it would be unwise to attempt to decide, without full and patient investigation. It is clear that they cannot result from any bodily settlement of the viaduct, as the foundations are perfectly solid; and any displacement due to the fracture of the piers is infinitesimal. That they result from the vibration of the platform, caused by the rapid passage of heavy vehicles, we suppose, no one can doubt. The combination of

granite setts, with a substructure possessing a certain amount of elasticity, under the stress of a traffic such as that of Holborn, is one without any very close parallel. It will be very interesting to compare the early experience of the very elastic bridge over the Thames at Westminster with that now to be derived from the City structure. It may turn out that this disposition of the setts to play on one another is only a practical mode of increasing the elastic resistance of the roadway. But it may turn out, on the other hand, that some modification of the pitching is advisable. The more or less elastic action of the corrugated plates forming the iron platform of the Viaduct, must also be regarded. On the whole, these very numerous cracks, whether they have been overlooked by Mr. Bidder and his colleagues, or whether they have made their appearance since the preparation of the report of those gentlemen, require careful investigation. They afford no ground for panic, or for serious alarm, but they certainly do demand examination and continued observation.

A lesson of great importance is to be deduced from the Holborn fractures. Many men have spoken of the "thin bed of Ross of Mull granite," as if a block of stone 4 ft. in diameter and 13 in. thick was a mere mason's spaul. On the contrary, these damaged blocks are in themselves noble stones. To suppose that granite of these dimensions is too slaty and paltry to be used when great weight has to be borne, is simply ridiculous. But the evil lies in the juxta-position of beds comparatively thin with ponderous monoliths. And here it is most interesting to observe how closely the taste of the artist accords with the science of the builder. The architectural beauty of the piers was somewhat diminished by the same cause. We do not say that it was thus necessarily diminished, but practically it was greatly injured. Had the hexagonal piers been built in 13-in. courses of the rose-coloured granite, no undue stress would have been thrown on the exterior part of a single layer. Whether they had been bedded in mortar or in lead, the weight would have been freely distributed, course after course, instead of being thrown on a few points under the angles of a monolith. The very care requisite for the formation of the single joint led to the evil. It is not, therefore, merely as an eyesore, but as an offence against structural rule, that we must hereafter carefully avoid the juxta-position of stone courses of very unequal magnitude. The ancient builders were well aware of this important canon of their craft.

Avoid the intermixture of monoliths and of slabs. See to the execution of your most important works with your own eyes. These are the inscriptions written on the Holborn Viaduct in a character more bold and more durable than golden letters.

ART TEACHING: ITS PURPOSES AND ADVANTAGES.

AT the annual distribution of prizes at the Gloucester School of Art, Mr. Gambier Parry put these questions: "What is this art teaching? What is its purpose? What are its advantages?" and answered them by reading a paper, part of which we print:—

What is this art teaching? It is a significant fact that the Government have of late years put into active operation schools of art over the whole country. There are at present as many as eighty-five schools of art in England alone; in Scotland, eight; in Wales, four; in Ireland, five. The arts,—I mean those of high aim, above mere arts of ingenuity and handiwork, and therefore called fine arts,—had fallen to a very low degree in estimation and in practice in this country. There had been a time when the case was entirely otherwise—when we had national arts clustering beautifully round a national architecture; but then came a time of great trouble and confusion, which forced men's attention and energies into a very different channel. Great social and political troubles supervened. The foundations of society had been very much shaken at the time of the Reformation, and by the events following or resulting from it. The shock had been great, indeed. The habits, the principles, the tastes of the people were changed by the political, quite as much as by the religious, results of that great event. For some time society appeared to be going through a process of reconstruction. Among other results of this great social disturbance the finer arts suffered much. They were in some cases discouraged for reasons supposed to be based on religious objections; and in other cases they drooped for want of national interest and sympathy. What taste for them remained was to be found exclusively among a limited number of the wealthier families. But their patronage was not sufficient to call out native talent, because the nation was itself indifferent. The result was that, in answer to the demands of the small upper-class, such men as Vandyck, Sir G. Kneller, and Sir P. Lely were induced to come to England to paint their portraits, and Canaletto to paint views of their houses and landscape scenes in London. There were at the same time a few English artists in oil painting and miniature, for portraiture; but for higher inventive and illustrative art on a large scale there was no one. A few anecdotes may serve to illustrate the decadence of art in England after the time of the Reformation. Much had been destroyed then. But later, in the time of Queen Elizabeth, in the thirteenth year of her reign, at a Convocation of the Bishops, a canon is recorded to this effect:—"The churchwardens shall see that the churches be kept clean, &c., the pictures of false and feigned miracles be demolished, and that the walls of churches be fresh whited,"—and so forth. This was a sweeping order; but I beg you to observe that it only applied to false and feigned and untrue inventions. Still, the result was most distressing. Religious and political partisanship existed then, in its own degree, as we have it in our own degree in our days. The order for destruction was exaggerated out of spite, and party antagonism was carried to great excesses. Horace Walpole mentions a story of a certain ruffian named Blees who was hired, at 2s. 6d. per day, to destroy the painted windows of the church at Croydon. Of course, this, like scores of others, was one of the Puritan excesses never contemplated by the order of the bishops. We find the tide turning soon after, and the expression of grief and vexation at this destruction being loudly expressed. Among the State trials in the time of Charles I., there is a case of a certain H. Sherfield, against whom proceedings were instituted for breaking sacrilegiously the painted windows of a church. One of the witnesses against him speaks thus:—"I undertake that there are some spirits abroad now, that if they had been alive in King Solomon's time would have gone nigh to have done violence even to the Cherubims in the Temple. God only knows what would have become of them!" But, to bring the illustration of the decadence of art still nearer to our own time, I must quote from the report of the first Commission on Arts and Manufactures in the year 1836, in which one of the witnesses examined about the condition of the art world in this country refers to his early days, and tells this story:—"A fellow-student of mine, named Baxter, who was educated in art at the Royal Academy, being in distress, went to one of the leading patrons of art in his day, and, speaking about ornamental porcelain, the gentleman said to him:—'I obtain all my vases beautifully painted from France: there are none equal to them.' He then took some of them down from his cabinet, and showed them to the poor artist. Baxter was delighted to see them, and said,—'Sir, they are all of my doing: I painted them all. But they have the French mark upon them, because such is the estimation in which art is held in this country, that works will not sell without undergoing this wretched transformation.'" Poor Baxter was much employed in the early days of art manufacture in the Porcelain works of Worcester: to such a point had all national care for finer arts fallen in this country. It is only when things have arrived at their lowest point that they begin to rise. That rise in the matter of art has been steady and permanent. In the year 1813 an accomplished man, Prince Hoare, writing in his work entitled "The Epochs of Painting and Sculpture," thus ends his essay on the revival of art in England, saying, in words which now sound like an inspired prophecy,—"The arts of design await the encouraging mandate of the State. To attain the position due to them, there are these three essential means: 1. Let the knowledge of design be generally diffused. 2. Educate artists honourably to themselves. 3. Employ them honourably to their country." Thus was the note struck for the turning point of fine art as a matter of national interest and concern. Those words of Mr. Hoare have been carried into most effective practice. The recommendations of Commissions of Parliament have been adopted, and a department for the cultivation of the fine arts has become a national institution, fostered by the authority of the Government, aided by the votes of Parliament, and, I am happy to say, responded to by the approval and satisfaction of the country. Thus, sir, we see that instruction in fine art has been adopted by the voice of the country as one of the branches of national instruction. This is my answer to the first question which I proposed to you. The second question was—What is the purpose of this teaching of art? My answer is, that necessity is the mother of invention in more ways than one. As times of peace and the arts of peace progressed together, our national aptitude for mechanics developed itself in manufactures: we were, with all our power, and many valuable qualities, a rude and rough people. Our climate was rough and chilling; our geographical position obliged us to great exertion in the world's competition: the great principles of our constitutional liberty, not only opened the way, but forced the way, to national advancement by individual exertion. The consequence was that to recover our national and individual losses, our people threw their whole energy into trade. Our manufactures were developed by the application of machinery, and our commerce was spread over the whole world. We became proud. But as pride cometh before a fall, so surely were we to be humbled. We became great, and proud, and vulgar in the wealth we gained. But our work was that of the hewers of wood, and drawers of water. We could labour and produce, but the finer sense of other nations demanded something beyond mere gross material production. Our commerce flagged; we found that there was an element in production superior to our own. As a nation, we had despised and neglected the finer arts. But we soon found that without them our productions failed. We learnt the humiliating lesson that our part was the gross material part of labour, but that there was an intellectual quality which in our folly and pride we had despised, but without which, to give life and value to our productions, they were worthless. So we had to beg from other nations: French, and Germans and Italians were invited to our principal seats of manufacture; and to them, by their accomplishment in the arts, we are indebted for those qualities which enabled our manufacturers to retain their place in the world's estimation; to those foreigners I say we were thus humiliated by obligation, while our workmen merely performed the material labour of production, and our tradesmen performed the labour of the counting-house. The grosser material labour was ours; the higher qualities, which made our manufactures saleable, were due to foreigners. This was humiliation; but it was humiliation of pocket no less than humiliation of intellect. Our manufacturers awoke to the idea of how great gain it might be to train our own men rather than thus be dependent on foreigners. Our more intelligent workmen next awoke to the idea of how much was lost to their class by the national blunder. The finer qualities of intellectual cultivation had been neglected. Our people at last acknowledged the error and the humiliation. If there is one characteristic quality of our very mixed race, as English people, more valuable than another, it is that, be the demand upon us what it may, some of us are certain to be found who will answer to that demand. The variety in our blood insures us variety in our powers. Our national difficulties may have depressed us, and our political and religious habits may have discouraged the cultivation of our finer qualities; but those qualities were within us, only dormant, and when the call should be made upon us we should rise to it. Small as our country is compared with other nations, we have gained, always and only under God's Providence, a gigantic position in the world. By energy and enterprise, by naval and military prowess, in war, in peace, in industry and commerce, we have gained the highest honours of our national position. But we have something yet to gain in the world's race: we have been excelled by others in the finer qualities of intellectual cultivation. But who need fear if only our energy is called forth? If in those finer qualities of cultivated genius England has produced in poetry (which is the living spirit of the arts) such men as Chaucer, Shakspeare, Milton, Spencer, and a host of others, grave and gay—and in the arts themselves such men as Wren and Chambers, Gainsborough and Reynolds, Flaxman, Chantrey, Turner, Wedgwood, and scores beside them,—surely there can be no fear that if the nation calls forth the spirit of the finer arts, it will not come forth. Such is, then, my answer to the second inquiry—What is the purpose of

education in the arts? It is to raise our people in those attainments of intellectual cultivation in which we have been surpassed, and to call forth their dormant genius. This is a great aim and purpose.

THE LAST PROPOSAL FOR UNITING ENGLAND AND FRANCE.

A French engineer, M. Eugene Burel, has been in England to explain his plan for shortening the distance between England and France. He has nothing to do with bridges over the sea, or tunnels under it, but would simply improve it off the face of the earth; in other words, fill up the Channel on both sides, and reclaim the land, leaving only a passage a mile wide to be traversed by ferry-boats every five minutes. M. Burel is a grave, serious gentleman, and really believes in his scheme, whatever our readers may think of it. They may like to hear him speak for himself, and this is what he said on the subject the other night at the dinner of the Society of Engineers, when he returned thanks as a visitor. "My scheme," said he, "is for neither a tunnel nor a bridge; it is the old mother-land restored from the sea as it was seven thousand, seven hundred, and twenty-four years ago. Allow me to add one new county to England and one department to France across the Channel, and thereupon to establish a railroad. By the time this will have been accomplished, with the increase of speed that will be attained I will make you go from London to Paris in five hours. I do not wonder that you laugh at the first communication of such an idea; for some of our master engineers said to me, in the similar instance, that this was a folly a little worse than the other proposition to the same end.

However, I want you to think of it, and not to be too hasty in decreting the impossibility. One thing is in my favour, and that is the numerous examples of such restorations of land, although on a minor scale; and it requires nothing but a combination of the most approved systems of *assisting nature* (as your celebrated engineer Telford said) to accomplish this, at first, extraordinary-looking work. Some say that England would never admit of being altered from its present situation of an insular land to which she considers she owes her independence and her supremacy on the seas. I will not discuss now any political question, although I consider the unlimited increase of the means of communication between all the nations of the world to do the best some day or other, and set at rest every bit of unworthy consideration of this kind, especially when time will have still more proved the benefit of the general union of the trades and commerce between all nations.

But I will say one thing, and that is, that assuming the isthmus to be still there as it was formerly, before the Diluvium Cimbricum, as reported from ancient traditions by Florus, and demonstrated by all the geological transactions, we should have to call M. de Lesseps to bore it, as there should be still a greater need of his scheme there than at Suez. Now, under such considerations, I would restore the land, not completely, but only so far as to leave a narrow channel one mile wide in the middle, and thus both the free circulation of the seas and the political question would be safe. In fact, my solution of the difficulty is a solution of contiguity. You say one mile is too little: I answer,—No, it is not; for, I do not care whether it be one or twenty miles, when I think of the ferry-boats that are spoken of for the next year, which will be able to transport an army, or when I think of the guns that will soon afford us the possibility of firing against each other without parting from our shores. Had we not better advance at once, facing kindly to each other, so near as to shake hands over the water, while the ferry-boats would cross it every five minutes, transporting backward and forward all the treasures of our industries?"

With the best possible feeling we advise M. Burel to waste no money on the prosecution of his scheme. We will not venture to say what changes in opinion may take place one of these days, but at the present moment England has no desire to give up her insular position.

SOME ACCOUNT OF A NEW TESTING MACHINE.

The recent accident at King's College brings vividly before us the necessity of the greatest precaution being taken as to the strength and quality of the materials of which our buildings, particularly our public buildings, are constructed. By a special providence no lives were lost; but had the failure occurred only a few hours later, more than one hundred families would have been driven to mourning.

But for faulty cast-iron girders the accident probably would not have happened. When the building was erected, about thirty-five years ago, the use of iron was less understood than it is at present; and even had the material been sound and perfect, it appears to have been charged with more weight than would now be considered prudent, so that the moment adverse circumstances occurred it failed.

The difficulty of obtaining correct data for the calculation of the strength of various materials in their practical application to constructive works has been very considerable. In one instance where the quality of iron was in question, and before the erection of Mr. Kirkaldy's apparatus, it was desired to test certain girders, not as to the actual weight they would carry, but as to the tensile strength of the iron (wrought) of which they were made (they were riveted girders), and, after a good deal of trouble and delay, as it was for a Government work the use of the cable-testing machine in Woolwich Dockyard was granted. The result was satisfactory—more than 25 tons to the square inch. Had it not been, however, for the peculiar circumstances of the case, it would have been almost impossible at that time (about eight years ago) to obtain within reasonable distance of London an independent satisfactory solution of a similar question.

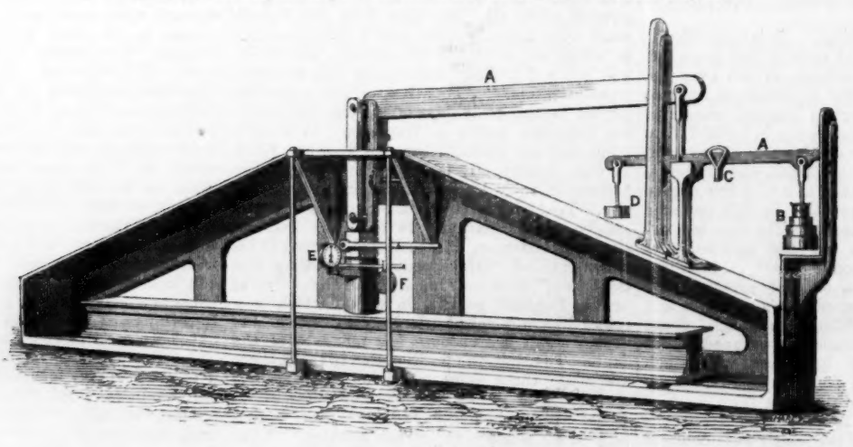
Hodgkinson's experiments on cast iron have considerable completeness, and as cast iron breaks and does not bend, the test is tolerably absolute, and, with the usual large allowance for bearing weight in proportion to breaking strain, his results may be taken as satisfactory data. But the great objection to the use of cast iron is the uncertainty of the manufacture. One girder, apparently equal to its fellow in strength, may have a hidden flaw in the casting which reduces its strength one-third or perhaps one-half; while in wrought iron, from the method of manufacture, this is impossible, and equal sections may be reckoned to carry equal weight. The use of cast iron, especially for long bearings, is rapidly going out of date; it is superseded, for ordinary building as well as for engineering works, by rolled iron, either in the form of solid rolled beams or as riveted girders, with which we are all familiar, built up of plates. In many instances these girders are of such large dimensions as to preclude any test being applied previous to their completion *in situ*, except,—and this is most important,—as to the *quality* of the iron of which they are composed.

Again, Belgian and other foreign irons are being introduced into the market, and it becomes therefore more and more desirable that the architect, the engineer, and the contractor should have some ready means of ascertaining the quality of the material he is purchasing; such means, however, being rarely within the compass of a private establishment.

There is another point also of much interest in the general building trade, which will, no doubt, have some additional light thrown upon it by actual experiment,—the opinion that most of the constants in use for calculating the strength of beams are too high. A comparison of Tredgold, Barlow, and Clark will show a difference of something approaching 100 per cent.; Tredgold being the highest, Clark the lowest, and Barlow about midway.

It is very desirable that a fresh set of experiments should be instituted extensive enough to furnish us with a really authoritative formula, especially for the large scantlings, which are not so strong in proportion as the smaller ones, upon which, however, the higher constant is based. Some of the failures of heavily-framed timber constructions may probably be traced to this cause.

MESSRS. SHAW, HEAD, & CO.'S TESTING MACHINE FOR GIRDERS, &c.



Operation of the Machine:—

1st. By levers (A), which re-act, direct with the press, and are so arranged that 2 lb. at B equal one ton on the specimen, the weight C counting the cwts., D being the adjusting counterpoise.

2nd. By pressure-gauge (E), which registers the pressure per square inch, or can be changed to register the tons.

3rd. By lever-gauge (F), which is arranged in the proportion of area of valve to area of piston of press, and thus registers tons on the object tested.

Messrs. M. T. Shaw, Head, & Co., of Cannon-street, have recently erected a machine at their Bankside wharf which provides the necessary facility for submitting these various materials to the test; its more special object, however, being to bring home, as it were, to every man's door the opportunity of ascertaining the tensile strength of the wrought iron he may be purchasing. The machine is an ingenious combination of the cast-iron girder, the hydraulic press, and the compound lever, as shown by the accompanying diagram.

The frame, somewhat resembling a queen-truss in shape, is built up of three heavy castings (bolted together) at the points, occupied in a truss by the queen-posts. The width of the upper and lower flanges is 2 ft. 9½ in., and the cast iron is 1½ in. thick; it is further strengthened by two tie-bars of 2-in. wrought iron from top to bottom at the same point. It is, in fact, a gigantic application of the principle of the scale-beam, the weights being adjusted at the extremity, and simply exerting their force by the principle of balance, as applied by the compound lever on the hydraulic press in the centre, by which the "proof" is applied with accuracy and facility, by the simple depression of the ram at that point. The maximum pressure that can be thus exerted is 50 tons in the centre, equal to 100 tons distributed, and the machine will prove anything up to 34 ft. long, 1 ft. 6 in. wide, and 3 ft. high. In the diagram the girder is not shown sufficiently raised up at the two ends.

The proportions are as under:—The length of the first lever is 3 ft. 11½ in., and that of the second lever 13 ft. 4 in., the first lever giving a multiple of 40 to 1, and the second of 28 to 1. It thus follows that whatever weight is applied at the extremity multiplied by these figures, gives the amount of pressure exerted downwards upon the centre of the material to be proved; *e.g.*, 28 lb., one quarter of a hundred weight. 28 × 40 × 28 gives an exerted force of 31,360 lb., or as nearly as possible 14 tons.

The levers are of polished steel, manufactured with the greatest care, and the dial gauge indicates the most minute alteration of pressure. The ram is 6 in. diameter, and there is an escape valve, that, when the pressure reaches the limit of safety, releases the oil with which the ram is charged, and precludes all chance of accident. A clever adaptation of reversing power enables the force to be exercised as a tearing strain, thus giving facility for exactly determining the strength of any section of iron submitted to the strain.

Many questions which are continually occurring in practice, both to engineers and architects, as to the comparative strength for various purposes of different sections of wrought or cast iron may here be readily decided at a moderate expense, as Messrs. Shaw, Head, & Co. propose to put the machine at the service of the profession at a low charge, so as to enable any to ascertain with accuracy the comparative strength of the many varieties and manufactures of rolled and wrought iron. It is right, however, to say that what they mainly desire is not so much entering into rivalry with elaborate testing machinery set up for public use elsewhere, as to enable their own customers to make themselves certain as to the strength of girders and other works manufactured by the firm.

We subjoin the record of an experiment made in our presence as an example of the working of the machine.

It was made upon a wrought-iron rolled solid beam, 21 ft. 6 in. clear bearing, 12 in. deep, flanges 6 in. wide. Total sectional area, 17 square inches; sectional area of each flange, 6½ in.

			Inches.	
At	5 tons	the deflection was	$\frac{7}{16}$	(No set.)
	8	" "	$\frac{3}{4}$	(trifling.)
	16	" "	$1\frac{1}{2}$	"
	20	" "	$2\frac{1}{4}$	
	22	" "	4	

The top flange buckled with less than 24 tons in the centre.

The calculated breaking weight of the girder, bearing as above, was 22 tons.

The Site of the Fleet Prison.—The Common Council have agreed to convey to the London, Chatham, and Dover Railway Company, for the sum of 60,000*l.*, the freehold interest of the corporation in a piece of ground on the east side of Farringdon-street, the site of the late Fleet Prison.

ON THE LIMITS OF VARIETY IN ARCHITECTURAL DESIGN.*

WE are going to inquire how far it is possible for us to produce perfect originality in design; and to that end we must examine the different sources of variety in design, some of which appear to be unlimited, others more or less limited, in extent. There are two important matters that would appear to require special attention in these inquiries; that is to say, outline and style. The first, however, of these we must leave, as requiring a separate treatise of sufficient extent to occupy a whole evening's attention; and the other—that is, style or school—being a *result*, and not a primary source of variety in design, we shall only introduce incidentally, and by way of occasional illustration.

In the more detailed view of art that we are about to take, we shall observe six of those sources of variety:—1. Order of proportion. 2. Mode. 3. Order of projection. 4. Method of Construction. 5. Material. 6. Individual taste. And we do not pretend to make any new or wonderful discoveries, but only to lay before ourselves that which we all know already in such a manner that we may be better able to make, perhaps, better use of it than we have hitherto succeeded in making.

We shall use the word order in such a way that it may apply not only to those two schools of architecture with which conventionality associates it, but to all schools, as far as possible, that now exist, or that may hereafter be produced, or discovered in plans at present unexplored.

We shall before very long be met with the remark that our predecessors in art designed what they thought *looked well*, without regard to any rule. But real experience in designing will show us that a good sound fundamental, not scholastic rule, is a great help, and far from being a means of restraint.

Most buildings of any importance are divided into a certain number of bays, compartments, or sections, for the convenience of construction, and of lighting the interior, and for other economic purposes.

The word *section* is more properly applied thus than to the cutting through of a building to show its construction. The Latin word *sectio* means a portion or division of a treatise or object for architectural section, longitudinal or transverse, would be more properly termed a *scissure*, from *scissura*, a Latin word of identical meaning with this.

It will not be too presumptuous to suppose that the class of objectors above mentioned will admit that in any one of these sections or divisions there must exist some proportion between the height and width,—that is, from centre to centre of column, buttresses, pilaster, pier, or atilæ. The height being that of a single story from base line to top of column, springing of arch or underside of epistylium, according to the mode of construction.

We must now beg leave to be allowed to divide that width into as many parts as we like to form a scale for our orders, and having obtained permission, we will divide it into four parts, and according to the number of times these parts are contained in the height, so we may classify our orders.

Now, you see, in this source of variety there is no *certain* limit, though at the same time it is not of infinite extent. It is left to individual taste where to place the boundary.

Except in such a building as a bridge, which may be considered a sub-ordinary, less than three parts should not be used for the height. Our old church architects in their simplest structures, and the Italian masters in their attic stories, seldom went below this. Calling this the first order in ordinary designs, nine of these parts will give the seventh order,—a proportion seldom exceeded either by precedent or good taste, except in a peristyle of detached columns, which may be looked upon as a superordinary structure.

Now, concerning ordinals, that is, accompanying details to the several orders. The Greeks to a certain extent, the Romans to a greater extent, the Italians to a still greater extent, and the modern uninventive imitators to a positively *insane* extent, associated a certain *mode* inseparably with each order, so that we have come to use the proper adjectives, Doric, Ionic, Corinthian, as though they were ordinal numerals, and suitable for distinguishing one degree of successive rank from another.

If we use a simple shaft for our first order, as the English church architects generally did; four shafts for the next order; eight for the next, as the above masters also frequently did, and if we add four shafts, also, to each successive order, our sixth order will contain twenty and our seventh twenty-four. Now, substituting hollow flutings for shafts in these upper orders (they are more suitable), this is exactly what we find in those two well-proportioned Greek examples, the temple of Thesius and the Ionic temples of the Ilyssus. The first of these is in the Doric mode, and the other in the Ionic; but in the Temple of the Winds at Athens, the columns have but twenty flutes, and are lower in order as regards their distance than any Ionic example; and yet, here you see the *mode* is Corinthian. This example draws our attention to another ordinal,—foliation. It belongs to a particular mode, and we must not forget to revert to it in its proper place.

The Assyrians put their columns still closer together, and used rectangular indents for ordinals, and went as high as thirty-two or thirty-six to each shaft. Some good examples were burnt at the Crystal Palace, which is to be deplored. The convex flutings of the Egyptians, generally more in number than the Gothic shafts, and generally though not always less in number than the Greek flutings, are specially adapted for the middle orders in our scale. Now, it so happens that having granite instead of stone, and not requiring the arched construction, we find that the Egyptians actually did use these middle orders of proportion. The chief ordinal of the Roman school may be taken to be the leading horizontal lines in the entablature. The several orders show 3, 4, 5, 6, and 7. These are the faces of the architrave, the frieze, the modillion, mutule, dentel, and corona courses. The leaves used for decoration in the initiative mode of architecture, are in most schools more simple and less indented, or cut up, in the lower orders than the higher; this is noticeable in the example above quoted in the temple of the eight winds. This minor detail of decoration then forms another ordinal, and it is a useful study for the designer to sketch everything of this kind in nature that presents itself to his notice, and then to classify them according to his own taste and judgment.

The profile of mouldings should also vary according to the *order* of the composition. Both precedent and good taste authorise this arrangement. For while Mediæval and modern masters in the Italian school use in the lower, and even sometimes in the higher orders, mouldings of circular outline, we find little or no precedent for it in antique examples. In modern Tuscan and Doric, we find a quadrant-shaped echinus to the capital, but in Roman examples of these modes, we find ellipses of greater or less variation. In the high order of the Greeks, parabolas and hyperbolas are used, and in the low order of the English schools the circular profile finds its proper place. Now, we propose a scale of ordinated mouldings to agree with our orders of proportion, called the *declension of the conic scissure*. To provide for a series of seven orders, we take a cone of 60 degrees. The vertical scissure gives a hyperbola for the seventh order. The next, declining 15 degrees, gives an oblique hyperbola for the sixth order. The next, declining 15 more degrees, a parabola for the fifth. The next three, each declining 15 degrees, give three ellipses of decreasing variation for the next orders; and the oblative, prostrative, horizontal scissure, a circular contour for the lowest or first order.

The next source of variation is that of mode. All ornament may be said to belong to three simple modes, or to combinations of two or of all three of them, making four additional composite modes, and the plain unadorned, or Tuscan mode, as we should say, in reference to the Roman school, makes an eighth. And of those simple modes we have, first, the Geometric; 2ndly, the Decorative; and, 3rdly, the Imitative.

The Geometric mode is illustrated in the Greek and the Roman schools in the ornaments of the Doric examples; in the Norman school, in the capitals and ornaments of the arch, such as the chevron and billet; and in the earlier Gothic schools, in the geometric tracery of the windows.

The Decorative mode includes all ornament not geometric or imitative, such as is illustrated by free-hand drawing, without copying from nature. This is the true architectonic style, and is found in every school of architecture, in the time of the ancients, and in nearly all varieties of the

* Read before the Architectural Association, Friday, December 3, by Mr. W. Scargill.

Arabic, Hindoo, and Moorish schools, in the Romanesque, the Byzantine, and Lombardic.

And the remaining mode in the Corinthian mode of the classics, in the Egyptian, the Romanesque, and the middle periods of Gothic, in which latter it is used irrespective of order.

By the Imitative mode we mean that class of ornamentation which is copied from nature, more especially from natural foliage, and to which we have before alluded in our remarks upon ordinals.

The third source of variety in design is that of Projection. As regards this matter, we must have recourse to precedent, which furnishes us with six orders or degrees. 1. Incised ornament; 2. Superficial ornament, such as mosaic work and ornamental paving; and this order, though a minor order of architecture, embraces the whole art of painting,—a great art in itself, extending itself, in a manner, beyond the province of this art of architecture in which it finds its place as a subordinate feature; 3. Positive projection next begins in basso-relievo; that is to say, for the most part imitative ornament, in which the outline is preserved literally, but with a depressed projection or profile; 4. Mezzo-relievo, where both outline and profile are strictly true to nature, but the objects projecting but half their bulk from the plain surface which they serve to decorate; 5. Alto-relievo, which differs from the last only in the figure being nearly detached, or sunk but a fourth of its depth into the superficial plane; 6. And beyond this comes detached ornament, and this applied in the imitative mode develops itself in another of the fine arts, expanding beyond the province of architecture, and bearing the honoured title of the *Art of Sculpture*.

In the methods of construction we can hardly find room for an ordinated or classified arrangement. There would seem here to be two extreme points of limitation in construction: that is to say, the reponent and the salient, with but one or two points of transition. And beyond these we can find no new orders or arrangements sufficiently distinct to characterise a school either entirely new or entitely original and unique as regards its method of construction. But we must now explain the meaning of these terms *reponent* and *salient*.

Reponent, then, is the proper term to apply to solid masonry, in which every portion of material has a solid bearing. This construction only provides us with an enclosing wall to our building; for as soon as the necessity of a door, window, or roof presents itself, one step is taken in the direction of the other mode of construction, and this step is the habitative method. This construction, however, is associated with the reponent, and forms the great line of distinction of the Greek, Egyptian, Hindoo, and Syrian schools, from the Saracenic, Moorish, Romanesque, and Gothic.

The semicircular arch, belonging rather to the salient method, has this imperfection in its character; that, at one single point, viz., at the crown of the arch, it is related to the trabeative construction. The zenith of a vertically-placed circle being in that one point, and only one point horizontal in its direction.

The Gothic schools may be looked upon as perfect illustrations of the salient method, both in their arches and in their timber roofs,—that is, in those that have no tie-beam.

And all arcuative constructions, whose arches are formed by one curved line, whether circular, segmental, hyperbolic, or parabolic, may be looked upon as homogeneous one with another, as the same remark applies to them, as we just noticed, as applying to the circular.

These methods of construction, then, show us but little variety for our designs, the most we can make of them being these three,—the trabeative, the unilineal arcuative, and the bi-lineal arcuative. We must leave this head of our treatise for the present,—we shall revert to it in our concluding remarks,—and proceed to consider the question of material.

Both Vitruvius and the dogmatising revivers of classic art, insist very strongly upon a column of a certain mode, contain in its height a certain number of diameters, whether constructed of brick, stone, marble, granite, iron, or wood; and whether supporting a simple epistylium, a roof, or one, two, three, or twenty stories of superstructure. Now, if we wish to design with truthfulness, originality, or common sense, we must at least throw off such oppressive fetters of conventionality as these.

There are two circumstances in nature or in the conditions of architectural construction that will determine the thickness of a column or pier, after we have determined its height to suit our convenience, and its order and mode to suit our taste. One of these is the superincumbent weight to be sustained, and the other the material selected for construction. We may reduce these materials to about four orders, so that here we shall have another multiple wherewith to extend the limit of design.

The weight of superstructure being a fixed quantity, the greatest diameter will be required for columns of brick; the next less for those of stone or inferior marble; the third for those of granite or hard marble; and the least for those of iron, and also of wood,—for this, though less hard or durable than the others, is, or ought to be, used only to support superstructures of the same material.

There remains one more source of variety in design that has no limit and never will have. We have seen how many combinations and variations may be made by multiplying together a chosen number of orders of proportion and of projection, and a determined number of modes, methods, and materials. But we shall never determine how far these may be extended by that inexhaustible multiple *individual taste*. We might propose not only to each of those present in this room, but to all the profession that now exist, have existed, or are predestined to come after us to produce a composition of one fixed proportion, in one particular order, one mode, one order of projection, one material, and one method of construction; and if each one's own individual taste were followed, there would still be no two exactly alike.

We now see how unbounded in some directions, and in others how narrowly hemmed in, are our resources of originality. We see clearly how in one sense any number of new schools of art may be produced, and in another sense how impossible it is to do much more than reproduce; and this leads us to a few concluding remarks on the much-ventilated subject, the possibility or probability of a new school.

We almost disbelieved our own experience, when it first occurred to us that there does not exist to our knowledge a school of architecture in which the semicircular arch forms the leading feature, and which at the same time has a regular system of orders. In the Roman school the arch is a subordinate feature springing from an impost built against the column to receive it. The column of the Roman school is by no means adapted to carry an arch. In the first place, it diminishes upwards, as in the Greek school. The ill effect of a column of this kind supporting an arch may be seen at St. Leonard's at Shoreditch, Spitalfields, and other churches of the eighteenth century. Then the capital and abacus are most evidently of a suitable form to carry an epistylium, but not an arch. Sometimes a square block of entablature is stuck into each column, the effect of which is both hideous and laughable.

Now, by the time we have cleared away such an obtrusive feature as that above mentioned, done away with the tapering of our column, and designed a capital of the right form to connect the arch with the column, we shall have done something towards the production of a new school. But you will object that all has been done already in those several schools that may be called Romanesque, but in these schools there is no ostensible system of classification: there are no orders or ordinals that we can lay hold of so as to know at once how to treat a given subject, when perhaps we have little time for thinking. It is chiefly to save your time that the foregoing classifications of order, and mode, and other matters have been placed before you. And here we have just pointed out to you an admirable opening for originality in as perfect a form as that quality can be said to exist. Revert to what we have said concerning order, make your scale of orders, say seven, as above suggested. Draw these out in the eight modes we have described, simple and composite. There are fifty-six changes for you at once. Now vary these in five orders of projection, and you have 112 changes. Now try each of these in four different kinds of material, as we have also described, and you have 448 varieties of treatment, or, as some would say, 448 orders; and we may flatter ourselves that 448 orders are pretty good for a new school of architecture.

We said that we should leave out of the question the subject of outline, but it occurs to us at this moment that there is a noticeable analogy between this and method of construction; the trabeative being associated with a square, flat skyline; the salient with a pyramidal outline; and the circular-arched formation with the dome.

It remains for us now only to request of you that in any critical remarks you may be led to make upon this treatise, you will observe that it is composed of these distinct elements:—1. Matters of natural fact; 2. References to precedents; and 3. Our own suggestions: and that you will as much as possible recognise the difference between these as they occur, and not mistake one for another.

NEW BUILDINGS IN OXFORD.

According to custom, the local *Journal* and the local *Herald* give accounts of the progress of new works in Oxford during the past year. From the *Journal* we condense the following particulars. Restorations and building operations still continue. New thoroughfares are being thrown open, streets are being formed, houses built, and here and there a church, chapel, or school added to meet the spiritual and educational necessities of freshly-established localities. On the site of the old workhouse a large square, to be called Wellington-square, is being made, of a metropolitan character, with a garden in the centre, and "sub-ways" beneath the houses, as an improved means of inspecting the pipes and drains of middle-class dwellings. Houses of all kinds continue to be constructed, and the large villas on Norham Manor, as well as on the more recently laid out Bevington Estate, are cited as offering facilities to those desirous of residence here.

Balliol College.—The new Buildings in Broad-street, designed by Mr. Waterhouse, of London, are now occupied.

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Proctorial Rooms and Cells.—The establishment of a force which has absorbed the once separate element of University police has necessarily entailed considerable alterations in the accommodation required for the Proctors' men. The basement of the old Clarendon Buildings has undergone a complete change. The two cells in the eastern extremity will, as heretofore, be devoted to the detention of any females who may be found *flagranti delicto*. The old entrance at that end of the building has been closed, and one made at the western extremity, reached by a flight of stone steps. These will lead immediately into an ante-room and offices for the Proctorial staff, which is now entirely separate and distinct from the police, and is kept up for University purposes only. The basement premises will be warmed and ventilated, gas and hot-water pipes being laid throughout, on the "Perkins" system. The architect is Mr. Bruton, and the builder Mr. Wyatt.

Radcliffe Infirmary.—To the north wing have been added two turret-like structures at the north-west and south-west angles of the wards, containing ward-sculleries, lavatories, baths, &c. It is intended eventually to make similar additions to the wards in the south wing. The foundations also of a new pavilion for fever wards has been laid, and the building, which is of considerable size, is beginning to rise out of the ground. It will contain two wards, 51 ft. by 25 ft. and 15 ft. in height, with nurses' rooms, ward-sculleries, lavatories, baths, and all other offices; also a spacious hall, with an ample and easy staircase, and arrangements for ventilation. This pavilion will be eventually connected with the main building by a cloister-like corridor on the boundary between the infirmary and the observatory grounds. These works are from the designs of Mr. C. Buckeridge, the builder being Mr. Wyatt; whilst Mr. G. G. Scott has acted as consulting architect.

THE WORKS OF THE METROPOLITAN BOARD OF WORKS.

THE matter of the following communication is serious, and seems to call for the careful consideration of the Board of Works. We have the personal guarantee of the writer to establish the correctness of his statements should they be questioned:—

Sir,—Attention has been called at the Fulham Board of Works, to certain works in Westminster, Rotherhithe, and Kennington, under the control of the Metropolitan Board, at a suggested expense of a quarter of a million of money—partly executed, but either stopped or delayed from a difficulty in obtaining "Gault bricks."

The increased cost of these works is suggested at 35,000*l.* to suit the wishes of Mr. Grant, recently appointed for three months, to act *pro tem.* as chief engineer, at the rate of 400*l.* a year advance on his previous salary of 1,000*l.* The works of the Metropolitan Board are of the most expensive and costly character that can well be executed. The brickwork of the sewers,—which, when completed, merely form a culvert for conveying filth from our midst, and very shortly become thickly coated with a dark slime,—is constructed either of white Suffolk bricks, at a cost on the work of probably 84*s.* per thousand; of pressed Gault bricks, at 50*s.* per thousand; or of wire-cut Gault bricks, at 34*s.* per thousand; and a *selection* from the best stocks, at 27*s.* per thousand, is permitted to be used at the caprice of the officer or officers for backing.

The bricks are tried by a gauge, and unless perfectly true as a cube, are rejected, if not entirely, at least for face work: any dirt or discoloration or chipping renders them objectionable. The bricks are packed and delivered on straw, and probably other expenses render the work needlessly costly.

In every possible way the work is made to look smart and pretty; kept clean, brushed, rubbed, swept out, titivated, and brilliantly lighted up for the inspection and approval of a committee. All this has to be paid for, and adds another straw to the camel's back.

The labour in the work is of the same wasteful character, and varies in amount to from 5*l.* to 7*l.* per rod, occasionally much more, and then is not safe from being condemned, and done over again.

Much of the brickwork in the sewers of London has cost from 25*l.* to 30*l.* a rod, while under the late Commission of Sewers the contracts ranged from 11*l.* to 13*l.* a rod.

The quantity of work executed on the south side of the Thames under the assistant engineer in a portion of the main drainage may be approximately taken in the "Low-level sewers and Southern Outfall" as 10,700 rods, and the facing or extra labour on the joints in "Pressed Gault Bricks," "struck, cut, flush, &c.," as 1,290,000 feet superficial; the arch covering cleaned off and pointed in Portland cement: this last quantity is *exclusive* of that due upon a length of about nine miles of sewer. These quantities, be it remembered, represent but a portion of the Southern drainage. If the assumption as to quantity be correct, and that a saving of 10*l.* per rod might have been effected in the cost; the suggestion at the Fulham Board, instead of 35,000*l.*, should be on the brickwork only in Mr. Grant's district, 100,000*l.*, and on the whole metropolis a sum for Mr. Silas Taylor to calculate and possibly comment upon, or some other energetic member of the Board.

Granted that it is all-important such works be of the most enduring character; that the work should be in all respects equal to the object in view; still a due regard should be had to economy, and an overtaxed ratepaying public;—*ergo*, the bricks should be of the best description suited to the purpose, bearing in mind their relative value; and it is a fair question to ask,—Are Gault Clay bricks best suited for this purpose? and is it absolutely necessary to pay the increased cost of the work by their adoption?

Pressed Gault bricks, delivered for sewerage works, cost about 50*s.* per thousand; Wire-cut Gault bricks, delivered for sewerage works, cost about 34*s.* per thousand; best selected stocks, delivered for sewerage works, cost about 27*s.* per thousand.

So much for cost. Now a word as to strength and quality.

Pressed Gault bricks, under a recent trial, crushed with 102 tons on the superficial foot; wire-cut Gault with 158 tons; and best stocks with "137 tons." Are not the latter a material suited both as regards strength and price for sewer work, and the general works of the Metropolitan Board? and is not the using any more expensive material simply wrong? Again, why should the labour be more costly in sewer work than in our finest edifices, or in the palaces of our beloved Queen? If certain indefatigable members of the Metropolitan Board will look into this matter, and see who is the officer or party propping up this wasteful expenditure, they will do more service to the ratepayers than by superintending the works in progress as amateur engineers.

Rumour is abroad that one of the great outfall works is rather shaky; perhaps some member will suggest that the engineer-in-chief be requested to report upon the present condition and state of efficiency of the "Northern and *Southern*" outfall reservoirs and buildings, so that we may be assured the rumour is incorrect, or prepared for a further outlay on one of these gigantic works just and hardly completed, of probably 100,000*l.* The value of the works of the Board, especially on the south side of the Thames (where it has ranged 15 to 20 per cent. above the other districts, chiefly, it is assumed, through the severity in the supervision), is a matter fully understood by contractors; and the prices, although proportionately high, yet fre-

Arabic, Hindoo, and Moorish schools, in the Romanesque, the Byzantine, and Lombardic.

And the remaining mode in the Corinthian mode of the classics, in the Egyptian, the Romanesque, and the middle periods of Gothic, in which latter it is used irrespective of order.

By the Imitative mode we mean that class of ornamentation which is copied from nature, more especially from natural foliage, and to which we have before alluded in our remarks upon ordinals.

The third source of variety in design is that of Projection. As regards this matter, we must have recourse to precedent, which furnishes us with six orders or degrees. 1. Incised ornament; 2. Superficial ornament, such as mosaic work and ornamental paving; and this order, though a minor order of architecture, embraces the whole art of painting,—a great art in itself, extending itself, in a manner, beyond the province of this art of architecture in which it finds its place as a subordinate feature; 3. Positive projection next begins in basso-relievo; that is to say, for the most part imitative ornament, in which the outline is preserved literally, but with a depressed projection or profile; 4. Mezzo-relievo, where both outline and profile are strictly true to nature, but the objects projecting but half their bulk from the plain surface which they serve to decorate; 5. Alto-relievo, which differs from the last only in the figure being nearly detached, or sunk but a fourth of its depth into the superficial plane; 6. And beyond this comes detached ornament, and this applied in the imitative mode develops itself in another of the fine arts, expanding beyond the province of architecture, and bearing the honoured title of the *Art of Sculpture*.

In the methods of construction we can hardly find room for an ordinated or classified arrangement. There would seem here to be two extreme points of limitation in construction: that is to say, the reponent and the salient, with but one or two points of transition. And beyond these we can find no new orders or arrangements sufficiently distinct to characterise a school either entirely new or entitely original and unique as regards its method of construction. But we must now explain the meaning of these terms *reponent* and *salient*.

Reponent, then, is the proper term to apply to solid masonry, in which every portion of material has a solid bearing. This construction only provides us with an enclosing wall to our building; for as soon as the necessity of a door, window, or roof presents itself, one step is taken in the direction of the other mode of construction, and this step is the habitative method. This construction, however, is associated with the reponent, and forms the great line of distinction of the Greek, Egyptian, Hindoo, and Syrian schools, from the Saracenic, Moorish, Romanesque, and Gothic.

The semicircular arch, belonging rather to the salient method, has this imperfection in its character; that, at one single point, viz., at the crown of the arch, it is related to the trabeative construction. The zenith of a vertically-placed circle being in that one point, and only one point horizontal in its direction.

The Gothic schools may be looked upon as perfect illustrations of the salient method, both in their arches and in their timber roofs,—that is, in those that have no tie-beam.

And all arcuative constructions, whose arches are formed by one curved line, whether circular, segmental, hyperbolic, or parabolic, may be looked upon as homogeneous one with another, as the same remark applies to them, as we just noticed, as applying to the circular.

These methods of construction, then, show us but little variety for our designs, the most we can make of them being these three,—the trabeative, the unilineal arcuative, and the bi-lineal arcuative. We must leave this head of our treatise for the present,—we shall revert to it in our concluding remarks,—and proceed to consider the question of material.

Both Vitruvius and the dogmatising revivers of classic art, insist very strongly upon a column of a certain mode, contain in its height a certain number of diameters, whether constructed of brick, stone, marble, granite, iron, or wood; and whether supporting a simple epistylium, a roof, or one, two, three, or twenty stories of superstructure. Now, if we wish to design with truthfulness, originality, or common sense, we must at least throw off such oppressive fetters of conventionality as these.

There are two circumstances in nature or in the conditions of architectural construction that will determine the thickness of a column or pier, after we have determined its height to suit our convenience, and its order and mode to suit our taste. One of these is the superincumbent weight to be sustained, and the other the material selected for construction. We may reduce these materials to about four orders, so that here we shall have another multiple wherewith to extend the limit of design.

The weight of superstructure being a fixed quantity, the greatest diameter will be required for columns of brick; the next less for those of stone or inferior marble; the third for those of granite or hard marble; and the least for those of iron, and also of wood,—for this, though less hard or durable than the others, is, or ought to be, used only to support superstructures of the same material.

There remains one more source of variety in design that has no limit and never will have. We have seen how many combinations and variations may be made by multiplying together a chosen number of orders of proportion and of projection, and a determined number of modes, methods, and materials. But we shall never determine how far these may be extended by that inexhaustible multiple *individual taste*. We might propose not only to each of those present in this room, but to all the profession that now exist, have existed, or are predestined to come after us to produce a composition of one fixed proportion, in one particular order, one mode, one order of projection, one material, and one method of construction; and if each one's own individual taste were followed, there would still be no two exactly alike.

We now see how unbounded in some directions, and in others how narrowly hemmed in, are our resources of originality. We see clearly how in one sense any number of new schools of art may be produced, and in another sense how impossible it is to do much more than reproduce; and this leads us to a few concluding remarks on the much-ventilated subject, the possibility or probability of a new school.

We almost disbelieved our own experience, when it first occurred to us that there does not exist to our knowledge a school of architecture in which the semicircular arch forms the leading feature, and which at the same time has a regular system of orders. In the Roman school the arch is a subordinate feature springing from an impost built against the column to receive it. The column of the Roman school is by no means adapted to carry an arch. In the first place, it diminishes upwards, as in the Greek school. The ill effect of a column of this kind supporting an arch may be seen at St. Leonard's at Shoreditch, Spitalfields, and other churches of the eighteenth century. Then the capital and abacus are most evidently of a suitable form to carry an epistylium, but not an arch. Sometimes a square block of entablature is stuck into each column, the effect of which is both hideous and laughable.

Now, by the time we have cleared away such an obtrusive feature as that above mentioned, done away with the tapering of our column, and designed a capital of the right form to connect the arch with the column, we shall have done something towards the production of a new school. But you will object that all has been done already in those several schools that may be called Romanesque, but in these schools there is no ostensible system of classification: there are no orders or ordinals that we can lay hold of so as to know at once how to treat a given subject, when perhaps we have little time for thinking. It is chiefly to save your time that the foregoing classifications of order, and mode, and other matters have been placed before you. And here we have just pointed out to you an admirable opening for originality in as perfect a form as that quality can be said to exist. Revert to what we have said concerning order, make your scale of orders, say seven, as above suggested. Draw these out in the eight modes we have described, simple and composite. There are fifty-six changes for you at once. Now vary these in five orders of projection, and you have 112 changes. Now try each of these in four different kinds of material, as we have also described, and you have 448 varieties of treatment, or, as some would say, 448 orders; and we may flatter ourselves that 448 orders are pretty good for a new school of architecture.

We said that we should leave out of the question the subject of outline, but it occurs to us at this moment that there is a noticeable analogy between this and method of construction; the trabeative being associated with a square, flat skyline; the salient with a pyramidal outline; and the circular-arched formation with the dome.

It remains for us now only to request of you that in any critical remarks you may be led to make upon this treatise, you will observe that it is composed of these distinct elements:—1. Matters of natural fact; 2. References to precedents; and 3. Our own suggestions: and that you will as much as possible recognise the difference between these as they occur, and not mistake one for another.

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Keble College.—The work at Keble College has progressed considerably towards completion. The buildings include, at present, rooms for 100 undergraduates and six tutors, with lecture-rooms and temporary hall, chapel, kitchen, and offices. The gateway is at the south-east corner of the quadrangle. It is intended to add another story and a permanent roof to it at a future day. The quadrangle is about 220 ft. square. Rooms for undergraduates are arranged on the east, west, and north sides of it. The temporary hall and chapel are on its south side. A large opening on the north side is left for the proposed chapel, which is to be raised on a crypt, and approached by a staircase. The piece of ground to the west of the buildings will be laid out as a college garden. That to the south is left for future buildings. Red brick is used for the main body of the walls, relieved with a considerable amount of stone and of black and white bricks in bands and diapers. Brick, although largely used in collegiate buildings at Cambridge, has hitherto not been used in Oxford. But in the absence of large funds, brick was a necessity. The effect, however, of the too free use of black and white bricks is not considered satisfactory. It is regretted that the east front is so near to the trees, and a strong expression of opinion has been given that the whole of that front ought to be pulled down and re-built some 15 ft. or 20 ft. further back.

New University Schools.—The site for the new University Schools (where the Angel Hotel stood for more than 200 years) still remains unoccupied.

The Clarendon Laboratory.—This may be considered an extension of the New Museum, being, in fact, a connected wing at its north-west corner, providing habitation for the department of physics, presided over by Professor Clifton, F.R.S. The lecture theatre will accommodate 150 students or other persons. Forty students can work simultaneously in the experimental rooms. The cost of the building will be about 11,000*l*. The architect is Mr. T. N. Deane, Mr. Bramwell acting as local superintendent; and the work of the builder is being carried out by Mr. R. J. Symm. The dimensions of the principal rooms are as follow:—Ground floor, lecture theatre, 30 ft. by 50 ft.; examination-room, 20 ft. by 26 ft.; central court, 36 ft. square. First floor, lecture-room, 20 ft. by 27 ft. The effect of the building in connexion with the New Museum, and its proximity to Keble College, are not considered satisfactory. The style of architecture corresponds with that of the Museum. A view and plan of it have appeared in our pages.

Proctorial Rooms and Cells.—The establishment of a force which has absorbed the once separate element of University police has necessarily entailed considerable alterations in the accommodation required for the Proctors' men. The basement of the old Clarendon Buildings has undergone a complete change. The two cells in the eastern extremity will, as heretofore, be devoted to the detention of any females who may be found *flagranti delicto*. The old entrance at that end of the building has been closed, and one made at the western extremity, reached by a flight of stone steps. These will lead immediately into an ante-room and offices for the Proctorial staff, which is now entirely separate and distinct from the police, and is kept up for University purposes only. The basement premises will be warmed and ventilated, gas and hot-water pipes being laid throughout, on the "Perkins" system. The architect is Mr. Bruton, and the builder Mr. Wyatt.

Radcliffe Infirmary.—To the north wing have been added two turret-like structures at the north-west and south-west angles of the wards, containing ward-sculleries, lavatories, baths, &c. It is intended eventually to make similar additions to the wards in the south wing. The foundations also of a new pavilion for fever wards has been laid, and the building, which is of considerable size, is beginning to rise out of the ground. It will contain two wards, 51 ft. by 25 ft. and 15 ft. in height, with nurses' rooms, ward-sculleries, lavatories, baths, and all other offices; also a spacious hall, with an ample and easy staircase, and arrangements for ventilation. This pavilion will be eventually connected with the main building by a cloister-like corridor on the boundary between the infirmary and the observatory grounds. These works are from the designs of Mr. C. Buckeridge, the builder being Mr. Wyatt; whilst Mr. G. G. Scott has acted as consulting architect.

THE WORKS OF THE METROPOLITAN BOARD OF WORKS.

THE matter of the following communication is serious, and seems to call for the careful consideration of the Board of Works. We have the personal guarantee of the writer to establish the correctness of his statements should they be questioned:—

Sir,—Attention has been called at the Fulham Board of Works, to certain works in Westminster, Rotherhithe, and Kennington, under the control of the Metropolitan Board, at a suggested expense of a quarter of a million of money—partly executed, but either stopped or delayed from a difficulty in obtaining "Gault bricks."

The increased cost of these works is suggested at 35,000*l*. to suit the wishes of Mr. Grant, recently appointed for three months, to act *pro tem.* as chief engineer, at the rate of 400*l*. a year advance on his previous salary of 1,000*l*. The works of the Metropolitan Board are of the most expensive and costly character that can well be executed. The brickwork of the sewers,—which, when completed, merely form a culvert for conveying filth from our midst, and very shortly become thickly coated with a dark slime,—is constructed either of white Suffolk bricks, at a cost on the work of probably 84*s*. per thousand; of pressed Gault bricks, at 50*s*. per thousand; or of wire-cut Gault bricks, at 34*s*. per thousand; and a *selection* from the best stocks, at 27*s*. per thousand, is permitted to be used at the caprice of the officer or officers for backing.

The bricks are tried by a gauge, and unless perfectly true as a cube, are rejected, if not entirely, at least for face work: any dirt or discoloration or chipping renders them objectionable. The bricks are packed and delivered on straw, and probably other expenses render the work needlessly costly.

In every possible way the work is made to look smart and pretty; kept clean, brushed, rubbed, swept out, titivated, and brilliantly lighted up for the inspection and approval of a committee. All this has to be paid for, and adds another straw to the camel's back.

The labour in the work is of the same wasteful character, and varies in amount to from 5*l*. to 7*l*. per rod, occasionally much more, and then is not safe from being condemned, and done over again.

Much of the brickwork in the sewers of London has cost from 25*l*. to 30*l*. a rod, while under the late Commission of Sewers the contracts ranged from 11*l*. to 13*l*. a rod.

The quantity of work executed on the south side of the Thames under the assistant engineer in a portion of the main drainage may be approximately taken in the "Low-level sewers and Southern Outfall" as 10,700 rods, and the facing or extra labour on the joints in "Pressed Gault Bricks," "struck, cut, flush, &c.," as 1,290,000 feet superficial; the arch covering cleaned off and pointed in Portland cement: this last quantity is *exclusive* of that due upon a length of about nine miles of sewer. These quantities, be it remembered, represent but a portion of the Southern drainage. If the assumption as to quantity be correct, and that a saving of 10*l*. per rod might have been effected in the cost; the suggestion at the Fulham Board, instead of 35,000*l*., should be on the brickwork only in Mr. Grant's district, 100,000*l*., and on the whole metropolis a sum for Mr. Silas Taylor to calculate and possibly comment upon, or some other energetic member of the Board.

Granted that it is all-important such works be of the most enduring character; that the work should be in all respects equal to the object in view; still a due regard should be had to economy, and an overtaxed ratepaying public;—*ergo*, the bricks should be of the best description suited to the purpose, bearing in mind their relative value; and it is a fair question to ask,—Are Gault Clay bricks best suited for this purpose? and is it absolutely necessary to pay the increased cost of the work by their adoption?

Pressed Gault bricks, delivered for sewerage works, cost about 50*s*. per thousand; Wire-cut Gault bricks, delivered for sewerage works, cost about 34*s*. per thousand; best selected stocks, delivered for sewerage works, cost about 27*s*. per thousand.

So much for cost. Now a word as to strength and quality.

Pressed Gault bricks, under a recent trial, crushed with 102 tons on the superficial foot; wire-cut Gault with 158 tons; and best stocks with "137 tons." Are not the latter a material suited both as regards strength and price for sewer work, and the general works of the Metropolitan Board? and is not the using any more expensive material simply wrong? Again, why should the labour be more costly in sewer work than in our finest edifices, or in the palaces of our beloved Queen? If certain indefatigable members of the Metropolitan Board will look into this matter, and see who is the officer or party propping up this wasteful expenditure, they will do more service to the ratepayers than by superintending the works in progress as amateur engineers.

Rumour is abroad that one of the great outfall works is rather shaky; perhaps some member will suggest that the engineer-in-chief be requested to report upon the present condition and state of efficiency of the "Northern and *Southern*" outfall reservoirs and buildings, so that we may be assured the rumour is incorrect, or prepared for a further outlay on one of these gigantic works just and hardly completed, of probably 100,000*l*. The value of the works of the Board, especially on the south side of the Thames (where it has ranged 15 to 20 per cent. above the other districts, chiefly, it is assumed, through the severity in the supervision), is a matter fully understood by contractors; and the prices, although proportionately high, yet fre-

quently cause the failure—or, as it is termed, "smashing up"—of the parties, and all sorts of evils and inconveniences to the public. If what has been suggested be the case, the recent loan of 10,500,000*l.* will prove but an instalment of something more for the metropolitan ratepayers to contemplate and repay in part, leaving no mean legacy to future generations.

These matters will force their way on public attention, and the ventilation of the subject cannot be in better hands than those of the "editor and readers of the *Builder*;"—in fact, the engineers and architects of our time; the leaders and framers of public opinion in such matters; against which neither vestry, local or Metropolitan Board, nor Government itself, can long stand.

Finally, is it a fact that the cost of the works of the Board is excessive and unreasonable? If so, who is responsible? Secondly, is either of the "great reservoirs" shaky, and about to follow the College Dining-room,—*i. e.*, come to grief? Y.

THE WORKING OF THE HIGHWAY ACT.

The Government is again preparing to take up the question of roads, both turnpikes and highways. The turnpike system will doubtless be abolished as speedily as possible, having now outlived its time in liquidating generally the expense of forming good trunk or national roads throughout the kingdom, and these roads since the introduction of railway communication having become highways of only a local or district character, though still important and in many cases as heavily subjected to traffic, and in some cases more so, than ever. In Ireland there have been no turnpikes for a good many years, while in Scotland toll-bars are rapidly disappearing, and in France none exist. The mode of collecting road tolls, moreover, becomes much more costly than that of any other public rates.

With respect to highways in England, now of equal importance generally as turnpikes, and already comprising many of the latter whose Acts have lapsed, a circular letter from the Secretary of State has been issued to district highway Boards, requesting both information and suggestions as to the working, practically and financially, of the Highway Acts of 1862 and 1864 (which apply only to England). These Acts, in most of their provisions, such as the formation of district Boards, facility for the appointment of qualified surveyors, and the more enlarged and improved practical powers in their hands, are substantially the same as the Highway Acts for Scotland, which have worked so very successfully and satisfactorily for long, and we cannot see any reason why England should not have had sooner the benefit of an assimilation of law and practical experience on the subject; or certainly why, having received it, it should not realise in good time similar successful results as to roads, first in efficiency and ultimately in economy.

But the new Highway Act for England has an important drawback to general or speedy success,—which must be remedied,—in that it was made so far a permissive measure in the hands of Quarter Sessions for the counties, and not at once compulsory throughout the country, as Road Acts are in Scotland. The consequence is that its adoption led in many quarters, such as Yorkshire, Northumberland, &c., to much contention and delay, while in various counties it has not been adopted at all, and even in such counties as have been placed under its operation, the Act allows the old parish or township Highway Boards, with their nondescript surveyors, in existence at its passing, still to continue, though these, from the same inherent causes as above quoted, have proved little or no better than the annually elected, so called "surveyors." When the new Act was passed, it should have been compulsory and complete, and all such limited primitive institutions abolished.

It is therefore premature to ask or answer the Government inquiries, unless in districts where the Act has from its passing in 1862 been all the while in full operation. In Northumberland, notwithstanding the best intentions of the county justices, a great mistake, and consequent failure, was at the outset made, from the highway districts being constituted of an extraordinary size, that were impracticable alike for a Board or a surveyor to manage with either credit or comfort, certainly at all events for a good number of years, when an amalgamation and extension of districts might possibly afterwards have been made, where not counterbalanced, in the meantime by growing importance.

The Act commenced in April, 1863, in Durham and other counties which adopted it immediately after its passing, and, therefore, can only have been anywhere in operation, *at most* for a period of six years and a half. With districts of reasonable size, varying according to the extent of population, agricultural or manufacturing traffic and general importance; by the active administrative agency of *reasonably* constituted, unprejudiced, and intelligent District Boards, composed, as the Act at present provides, of a "waywarden" elected annually by each township, and the various county justices, *ex officio*, resident within the district or towns adjacent; and the appointment of qualified surveyors, with professional training and practical experience; the new Highway Act for England has, we believe, worked successfully, both as regards efficiency and economy, wherever thus fairly, fully, and judiciously tried, effecting already many necessary permanent improvements, as well as accomplishing much towards putting the highways generally into proper form and condition, and regularly so maintaining them.

We trust the Government letter will receive that candid, unprejudiced, and respectful consideration from public bodies which the adoption by the Legislature of such means of obtaining general and practical information on the question highly merits.

Special meetings of District Highway Boards are being held on the subject of the Government inquiries for information and suggestions relative to the Acts, and from what we know of several, altogether favourable replies and intelligent suggestions have been forwarded. D. B.

CONCRETE MACADAMISED ROADS.

My attention has been directed to several letters that have lately appeared in your columns commenting on the present inefficient system of constructing and maintaining the streets in London. I beg to bring under the notice of your readers a new system of constructing streets with macadamised concrete, invented by the engineer, Mr. Jos. Mitchell, of Inverness. An experiment, extending to 100 yards in length, was made with this concrete, on one of the principal thoroughfares in Edinburgh, three years and a half ago, and although subjected to heavy traffic during that period, the general surface has not worn half an inch. There can be no doubt the result of this experiment has clearly proved that it is the best formation of streets. It is free from dust in summer, and from mire in winter, and carriages running over it produce no more noise than over a well-made macadamised metal road in perfect order. Any irregularities that may occur in the surface can be easily repaired; and where there are gas and water pipes, the concrete can be cast in blocks, and laid over them, and so prevent the necessity of cutting up the surface. Of course the macadamised concrete is more expensive in its original construction than the ordinary macadam; but the saving to the community consists in the total freedom from mud and dust, the easiness of traction, and the saving of constant repairs and consequent annoyance and expense they entail. I wish also to refer to street-making with blocks (which, I think, is not required, except where the declivity is such that there would be a danger of slipping on the concrete), I think it has been proved that, for making durable work, a solid and unyielding bottom is necessary.

An experiment of this kind was also made in Edinburgh at the same time as the above was done. 3 in. of the macadamised concrete was first laid, and the blocks set and grouted with cement, and since then no stone has sunk or worn irregularly, simply for the reason that the beds and joints were set in this concrete, which when set is inflexible and impervious to water. There can be no doubt but the present mode of constructing streets generally adopted is very inefficient and a great waste of material.

Having brought those two modes of constructing thoroughfares with heavy traffic under the notice of your commissioners of paving and their surveyors, I would only suggest, in order to satisfy themselves fully on the subject, that they should see the experiment I have referred to in George IV.'s Bridge, Edinburgh; for I feel confident that some further experiments with this concrete will result in great economy to the public, as well as infinite comfort in the absence of mud and dust.

John Menzies, C.E.

THE FORMATION OF TASTE.*

If you, or any of you who are engaged in any work of the hands where beauty, even in the least degree, can enter in,—if you will become once for all well grounded in the principles of ornament, your mind and judgment will tell what is right, and your eye will guide your hand to execute it. I do not say that knowledge alone will form true taste, and leave you to devise forms of beauty, but I will affirm that natural taste is at all events either very rare, or very rarely capable, unless instructed, of being turned to account in manufacture or in judging the merit of manufactured articles. True taste, it is certain, seems to be as it were an instinct with some men; even if they have no conscious knowledge of the rules of proportion and harmony as applied to form and colour, yet the moment they see an ornamental or decorated object they can tell whether it be false or true. In the last lecture I gave you some notions of what these rules of proportion and harmony are as applied to ornamental art, saying a good deal about form, and very little about colour, for reasons I will presently give. I showed you that good ornament has always more or less of meaning in it: it can be understood,—it conveys, though often in very humble form, some particle or other of truth. This I called the *human* side of ornament, possessed in the highest degree by the highest kinds of ornament, paintings, and buildings, and sculptures. The other condition which ornament must fulfil was that of fitness,—*appropriateness*. This is a fetter, a bondage, but it is necessary,—necessary on three accounts. Firstly, because of the artificer; secondly, because of the use of the object to be ornamented; and thirdly, because of the material to be employed. The less artistic the workman, the lower and rougher the use of the object; the more stubborn the material, the more removed must ornament be from the wildness, the freedom, the variety, the richness, and the grace of nature—or even from that close representation of nature which a good picture very properly shows. Nature must still be the storehouse from which our ornaments are drawn: the egg must give us our cups, and bowls, and vases; the bramble, the rose, the lily, and the flag a thousand beautiful combinations of form and colour, which we can adapt to the particular object we are fashioning or decorating. But I will not further travel over the ground of my lecture on "Ornament," but proceed at once to see how far we can in our daily life and work carry out the principles of true art in metal work, wood-work, leather-work, and some of the other manufactures of the day.

Art in Manufacture.

Art in manufacture means something more than mere skill and cleverness, — it requires something more than a good workman. The steady hand, the strong arm, the powerful blow, the ready jerk, the proper twist, the true aim, and sound material, are all essential to good work of one kind or another, but the article turned out by their aid may be, and often is, though well made, plain, if not ugly. It answers, we grant, the purposes for which it was made, but we do not and cannot take any pleasure in looking at it, and as a result of this where we can we try to hide it. Is it a hinge? We make it so small that it becomes weak, and so very plain, that we countersink it to get it out of sight. Is it a chair? We use no tenons, no wedges, we seem ashamed of the means by which the chair has been put together, and it is only when it comes to pieces, or breaks up,—which, if it is what is called an elegant piece of furniture it is very likely to do before long,—that we discover that the secret of its make was the *glue-pot*. The plainest, the simplest, the cheapest objects are often better than those that cost more and pretend to be better, especially where the manufacture is an old one, handed down from generation to generation, and the forms of the article have changed but little for centuries: mats, water-pitchers, baskets, and pails and tubs of the cooper illustrate this fact. But especially when we compare these simple objects with the attempts at ornament seen on many or most of our household articles now-a-days, do we learn that the simple and unadorned often more nearly approaches what is beautiful. Bad attempts at ornament — ornaments which have no connexion with the thing ornamented—stuck-on ornaments—are worse than no ornament at

* By Professor Church; in a Lecture to the Cirencester School of Art.

all; but where ornament is true and appropriate, then not only is it a source of pleasure in itself, but may actually extend the usefulness of the object of which it forms an essential part. For if this object has become really pleasing, we no longer care to make it small and contemptible, no longer wish to put it out of sight. In speaking of two or three kinds of manufactures to-night, I want to show how soundness and strength of material, honesty of construction, appropriate design, and good form and colour, may be so combined as to make common and cheap things as well as costly things, not only answer their particular purposes, but give a real, thorough, quiet pleasure to those who daily use them. I can select a few only of the numerous manufactures of the country for my illustrations to-night. I propose to speak chiefly of the artistic treatment of the following materials:—1. Stone; 2. Wood; 3. Metal; 4. Pottery, Porcelain, Glass, Enamel; 5. Leather, Bookbinding; 6. Textile Fabrics, Lace, Embroidery, Basket-work.

Stonework.

It scarcely comes within my plan to speak of stonework, since it usually and rightly forms part of a fixed architectural structure, and is rarely fashioned into objects which can be moved. But a few words about the ornamental treatment of stone and marble may not be altogether out of place, since I shall thus be enabled to speak more intelligibly concerning the ornamental treatment of wood, pointing out the great differences in the nature of decoration which should be given to materials so different in kind as stone and wood. That the differences between these materials are great is evident enough when we think of the ways in which stone is fixed to stone, and, on the other hand, wood to wood. Stonework properly executed is capable of giving a sense of great pleasure even when it is not carved stonework, and not intentionally ornamental. If we wish to follow out the rules of good taste we should not build a very small house with very large blocks, nor put a very fine face on the stone if we intend it to remain quite plain. I know it is often the practice here to dress the stone of the smallest and plainest cottages until it presents the appearance of a new cheese just cut. This is called "neat;" I think it feeble. This high finish of the surface is out of place where there is not a hint of ornament—no high gables, no shadow from projecting eaves, no chamfered edges, no rich mouldings,—but just a thin painted square frame set in a square opening for a window, and a long painted piece of boarding set in an upright opening for a door. But though art may be shown in the simplest structures of stone if the proportions be just and the construction sound, yet it attains a more evident excellence in the carved capitals and mouldings of a richly-ornamented building. Here the nearer the eye and the finer the stone the finer the work may be; but to put fine work at the top of a building, 50 ft. above the eye, for instance, is not merely labour wasted, but is artistically wrong, for ornamental stone carving must be suited to the place it has to occupy, and must be worked not only in a rougher and bolder way, but in a different way, when it can only be seen from a good distance. Sculptured ornament must usually be strong, and if the stone be coarse-grained, broad and rough, no delicate tendrils and slight veins, but broad expanses of leaves and large massive flowers, arranged in true accordance with the spirit of nature, on carved stems, full of strength and springiness; no mere inconsiderate imitation of natural objects, but the disciplined expression of natural forms and facts; yet no falseness to nature, on the other hand,—no putting of leaves opposite where they should be alternate,—no combining the fruit of one plant with the foliage of another,—none of the common tricks of the carver to make his work look effective, if they cause it to be false. When you carve a capital, never forget it is a capital, and should look the thing; but never forget, too, that the lily-work with which you adorn your pillar should be as full of facts about that flower as its material, its position, and its use permit. No good carver will make two capitals exactly alike—that is to do machine work, not human work; that is to sink intelligence and feeling. You can carve a line of capitals, can you, because you can copy ten times over some poor copy of a capital that is put before you to imitate? A man who can do this and nothing more has no more learnt the nature of carved work than a man who can only turn the handle of a barrel organ knows how to discourse in harmonies of sweet sounds. In the times when the art of carving in stone was at its best in this country, we know from almost every building that remains that the workmen felt a real interest in their work, strove amongst themselves who should excel in novelty of thought, in richness of invention, in the nobleness of work. The master-mind of the architect directed indeed all, that there might be oneness in the design; but the working sculptors put their minds also to active use, that there might be variety in the details. Go out into the hedges and the road-side wastes, gather oak, and rose and ivy; bring in the broad leaves and pure flowers of the water-lily; take the bullrush, and the arum, and the hart's tongue; put them before you as you cut the stone, for they are no less necessary than the mallet, the chisel, and the gouge. Tutor the wilderness of these natural forms to your purpose; keep balance of form, strength of construction, temperance of curve. You may make mistakes; you may forget the nature of your material and the use of your work; but to make mistakes when striving after truth is better than to be correct, and cold, and meaningless. Do not copy over and over again old examples which have lost, at all events, their freshness, and their meaning too; ornament the buildings of your town with the plants of your country. I must add a word about marble. Marble when of one colour admits of similar (but more delicate) treatment to that of stone. But when marble is veined or mottled its surface must not be carved, nor is it a suitable material for foliaged capitals. If you cut a fine diapered ornament on veined Derbyshire alabaster, its regularity, which is one of its chief characters, is interfered with by the irregularity of the veining, which is its chief character. So with capitals carved out of variegated marble: the hollows and shaded parts may happen to be wrought in the white veins, and so their depth and repose be broken, while on the other hand the projecting masses may happen to be wrought in the dark parts, and so their relief be lost. Do not as a rule mix marble with artificial materials, as tiles.

Wood.

I have lingered too long over stone-carving, for I have much to say about wood-work. If you think for a moment of the texture and grain of wood you will see that it must not be worked into ornaments like those we should execute in stone. But before I speak of the kinds of decoration which are suited for wood, I must refer to two very essential points in all carpentry and joinery, namely, *construction* and *shape* or form. Unless we have sound notions about the way to put woodwork together, and to shape its general outline, we are not ready for decoration. From the earliest times of which examples remain almost to the present century joinery was put together honestly, and showed its wooden pins, its tenons, its joints, and its wedges. It could be taken to pieces for removal or repair without the least injury or disfigurement. Now the construction of a piece of furniture is concealed as much as possible, and is found to depend upon glue, nails, and screws almost exclusively. Not only is modern furniture, &c., less picturesque, less interesting, less convenient, less durable, and less strong on this account, but putty and paint have been thereby brought in to hide still further all construction, and to complete the disfigurement of the work. Mind, I do not say that you should always make a show of construction, nor that glue, nails, screws, putty, and paint are not useful in their way, but that when the balance of convenience and beauty is in favour of these things you should use them, when against them discard them. One common error in the shape or outline of most pieces of woodwork for the house is their roundness, their curves, their extravagant contour. There is a want of simplicity and quiet in them. They worry you by bending about in all strange directions. Sofas, chairs, sideboards, even chests of drawers show this error, and are often rendered uncomfortable if not useless by it. The legs of various objects of furniture, instead of being turned with slight mouldings and fillets are often either violently twisted or even spiral, or else are made of a podgy pear shape at once ugly and weak. Having drawn diagrams of the backs of sofas, pianoforte legs, chairs, and so on, on a black board, the professor said as many curves as possible had been introduced, but without successful result. The curved back of the sofa would not allow you to rest upon it, for which purpose it was intended. The legs of chairs, instead of being straight, to support the weight, are made weak by being twisted, and in some cases made spiral. Some people, too, admire the spiral-shaped legs, and yet they cannot support the weight put upon them. Another form in which extravagance of curve is shown, is on the peculiar pear-shaped legs of pianos, and I do not know anything more wrong than the leg of a piano. Now just look at the next leg of a piano you come across, and you will observe it has certain faults of construction. The curves are very extravagant, and such as you do not require. Sound construction and sober form being granted, we may now consider what kinds of ornament are best suited to wood. I can only refer to a few, such as carving, veneering, inlaying, staining, and painting. Some woods are too soft and too easily split to be carved well; to relieve large plain surfaces of such woods, grooves and mouldings may be run. A tough and hard wood like oak is well suited to carving, but it is not well as a rule to carve wood very round or in high relief. A wooden capital with such work would look weak, and the decoration would appear not to be part of the pillar, but stuck on. Wood works less easily than stone, and so our decoration of it must be more stiff. In the fifteenth century wood-carvers tried to overcome this difficulty by taking a curved piece of wood half an inch thick, carving it slightly, cutting out the pieces between the leaves, &c., and then mounting it in front of a hollow moulding.

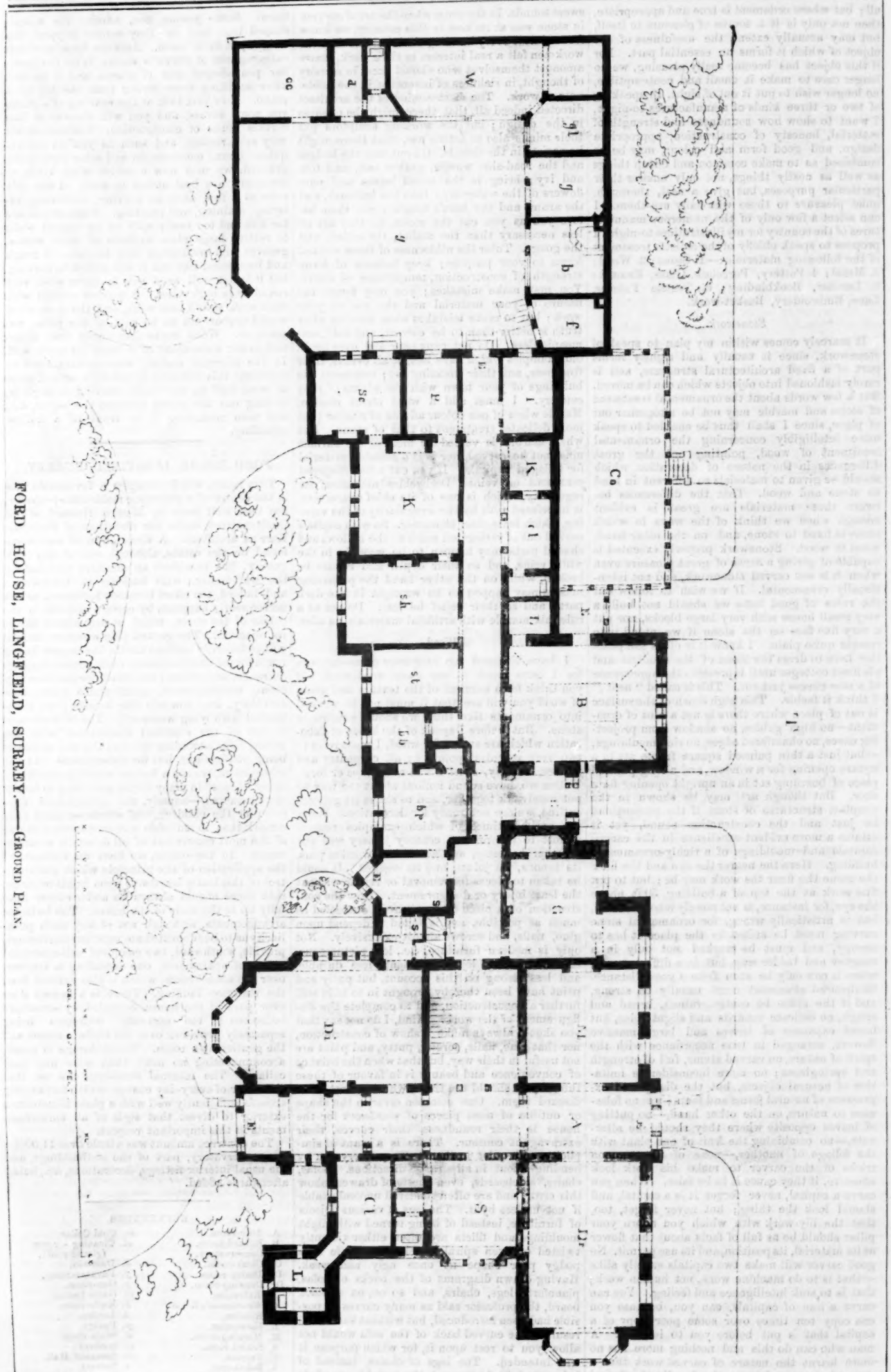
FORD HOUSE, LINGFIELD, SURREY.

THIS house, which occupies a favourable site in the centre of a charming residential property, has been well built by Messrs. Haward, of Old Quebec-street, under the directions of Professor Kerr as architect. A description of sandstone found on the estate, although not of any high quality, has furnished an effective material for the wall-facing, with backing of brickwork; and, indeed, the effect is rather increased, as not unfrequently happens, by certain defects in the colour of the stone, which at first almost led to its rejection. The ground plan which we furnish will sufficiently explain itself: the aspect being north for the chief entrance, dining-room, luggage entrance, and offices; and south for the drawing-room, morning-room, gentleman's room, conservatory, &c., towards the terrace; an ornamental lawn lying westward. The billiard-room is one of the standard dimensions, with the ceiling light according to rule; the wall windows being not for light, but for cheerfulness. In the school-room, we see a feature which is capable of being adopted in many forms, according to family circumstances,—namely, the ground-floor day-room for the children,—of which we need only remark that in suitable circumstances it is one of the most convenient of all domestic arrangements. In the offices, we have an instance of the application of the principle which the architect of this house has dwelt upon in his writings, that these should always be under rather than fully up to the scale of the house. The bedroom arrangements, although not of any such peculiarity as to be submitted amongst our engravings, provide, southward, two complete self-contained suites of apartments, one including a boudoir, over the school-room, which is also entered from the staircase landing. There is a second floor over part of the house, occupied by secondary bedrooms; the servants' bedrooms being separately provided over the butler's rooms and the gentleman's room. The cellarage is small, accommodating no more than wine and beer cellars. The internal finishings are of that character of every-day custom which fortunately accords sufficiently well with a plain Elizabethan exterior to divest that style of all embarrassments in this important respect.

The contract amount was a little over 11,000*l.*; the conservatory, part of the outbuildings, and the usual interior fittings, decorations, &c., being afterwards added.

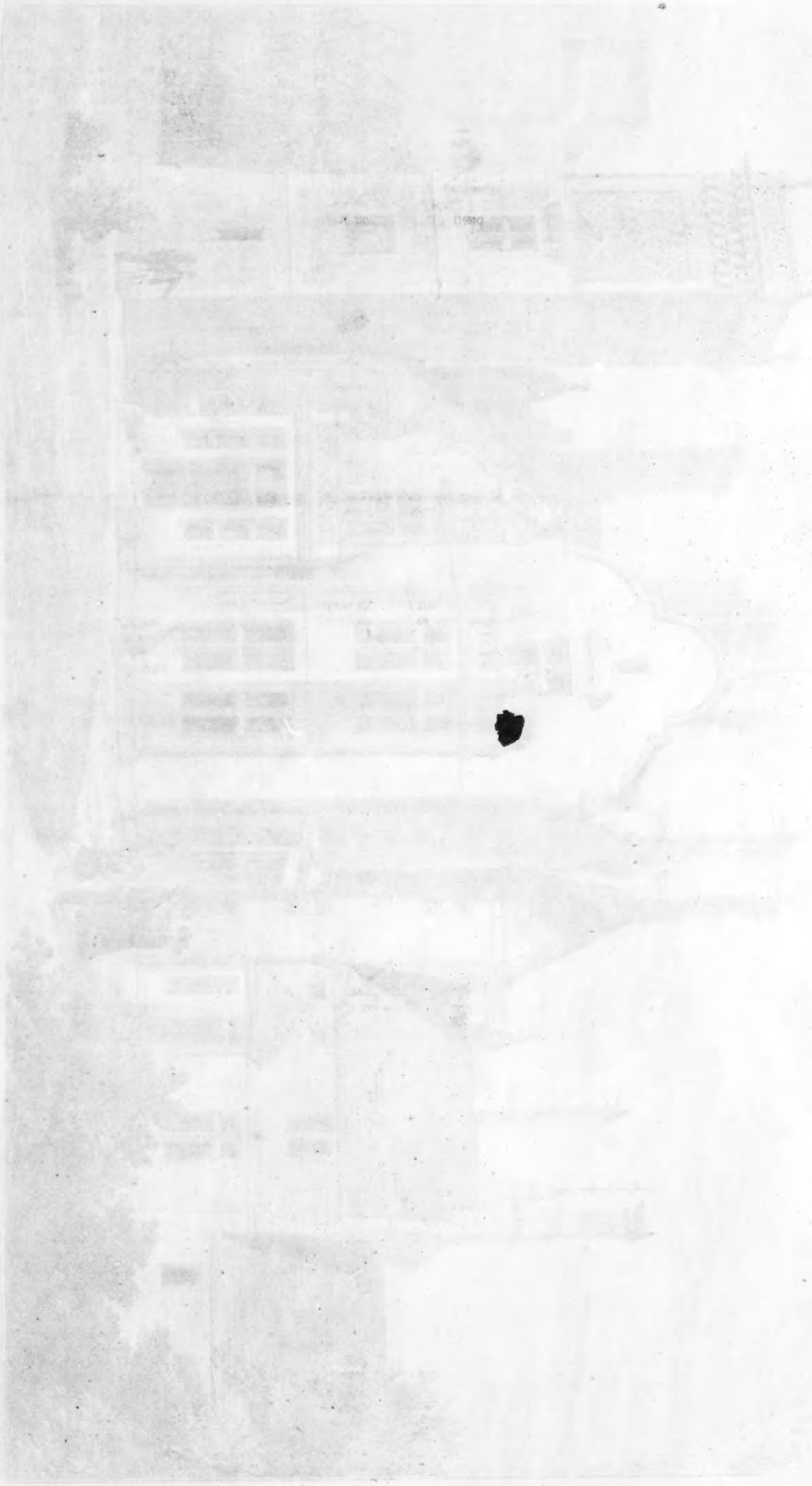
REFERENCES.

A. Ante-room.
B. Billiard-room.
Co. Conservatory.
Cl. Cloak-room.
Di. Dining-room.
Dr. Drawing-room.
E. Entrances.
G. Gentleman's Room.
K. Kitchen.
L. Lavatories.
M. Morning-room.
S. School-room.
T. Terrace.
b. Bakehouse.
bb. Butler's Bedroom.
bp. Butler's Pantry.
cc. Coal Cellar.
cl. Cleaning-room (glazed roof).
d. Dust-bin.
f. Furnace-room.
g. Gun-room.
gl. Game Larder.
k. Knife-room.
l. Larder.
p. Pantry.
st. Store-room.
sc. Scullery.
sh. Servants' Hall.
s. Servery.
w. Wood Shed, &c.
y. Yard.



FORD HOUSE, LINGFIELD, SURREY.—Ground Plan.

FORD HOUSE, LINGFIELD, SURREY.—PROFESSOR KERR, ARCHITECT.



HOW A VELOCIPEDE WAS BUILT.

THE *Builder* is a great power, and you, Mr. Editor, have much to answer for. A decade of years has about elapsed since my attention was first turned to the construction of velocipedes by reading one of your articles. The result was fearful, and had nigh been terrific.

I had long been brooding over some plan of locomotion that should entirely and for ever throw Hansom cabs into the shade, and place me upon the highest pinnacle reserved for the greatest economist of animal power.

I lived at a respectable elevation above the sea, and my abode was reached with some difficulty by both man and beast. In watching the overloaded horses toiling painfully past—for I was by no means at the top of the hill—and in often being the anxious spectator of a timber-wagon slipping its "skid," and thundering down, prevented simply from becoming an extempore avalanche by the poor brute in the shafts, who, upon its haunches, with fore arms extended, trumpet nostrils, and darting eyes, exerted its whole energy to keep the pressing mass from overwhelming it, my sympathies were enlisted for beasts of burthen, as well as for man; for I had seen both equally overloaded in ascending and descending. Your paper roused me to action, and I determined to make the weight do the work. Being a draughtsman, I did not theorise entirely. I soon found, by reducing my ideas to a 1-in. scale, and some of Whatman's drawing-paper, that even without a knowledge of mechanics it was easy to conceive that cranks and levers would not do. Of course, my idea was to make the load run up the hill by its own weight. I could make it run over a little hill,—a very little hill, but not over my hill,—that took me very little time to ascertain, and eventually I abandoned the investigation, so far as my four-footed friends were concerned. The difficult part of the question, I am ashamed to admit, I shirked, after a suggestion to the town council that they should construct tramways on the main thoroughfare, the loads going down pulling up those bound heavenwards, which suggestion was not discussed with that courtesy which I had expected from such an intelligent body of gentlemen. However, time being money, I could at any rate save some by giving to the world a machine that should entirely supersede walking, except for pleasure. Weight here, I had willed, should be to a great extent self-motive; but since I had to do with a living mass, who, by its own volition, could change position, the problem seemed at first sight much easier than I found it. Fewness of parts and simplicity were essentials; multiplication of parts and intricacy bogs, over which there was no hope of riding. My idea was hot; it had germinated. My scale and pencil forwarded it to such an extent that you only wanted to hear the sound of the beak pecking at the shell. By the aid of a builder I had this extreme pleasure, after a proper time of incubation. Night after night, week after week, went by in anxious expectancy; chips of the shell lay scattered in all directions, with here and there a tenpenny nail and some copper wire; the prodigy gradually unfolded itself; and the night it burst its shell in a barn, and appeared the fearful, the ghastly skeleton it did, in all its parts fleshless, but a living reality, will never be effaced from my memory or that of the one true and honoured friend who had had the felicity of working with me and sharing my confidence. "Is it done?" he exclaimed. My answer was a lofty nod. There it stood ready to bear me without fatigue, forty miles an hour, and with a little extra exertion ten or twenty more. I will not say I was proud of my achievement; the feeling was too etherial. I was aroused from my ecstatic trance by my fellow labourer saying—"Try it." No, no; that would have been abrupt; the poetry would have been spoiled. I intended to dally with my love. Softly and silently I led him from the presence, noiselessly closed and locked the door, and then we had a night. Probably the excitement was too much, or "Moets" was a little too sweet; but we could not manage breakfast on the morrow, neither did the design for the Manchester Assize Courts progress in that rapid manner which was its wont.

The day passed, however, and a moonlight night followed; and precisely at twelve, midnight, "it" was led forth, and was smiled upon by as much of nature as was visible. Its fleshless nakedness was not inviting—it was not beautiful; but the proud satisfaction was that it was useful. I adjusted the gear; I attached a stout rope to the axle; and I mounted, having previously, much to my friend's amusement, handed him the end of the rope to hold by, and keep me from going too fast. He pooh-poohed the idea, and let the cord dangle in his hand. "It" was not strong. It swayed weakly. One or two spokes started. The tire had a peculiar wave. The nave hardly looked in the centre. But we were together; had it collapsed, so should I, but it bore up gamely. In a second I should be darting forward, with an admonition to D. to hold fast. It moved. I remembered no more until D. picked me up. I was a little stunned as much by my success as by coming crack against a wall. My first sentence was, "Why didn't you hold?" Whereupon a lacerated and bloody hand was presented. The rope had been whipped out of his hand, and in his anxiety to stop me he had grasped at the revolving wheel; our workmanship not having been particularly smooth, his hand was scored rather deeply, and I was borne forward—nearly thrown into my bed-room window, and "it" was very severely damaged. Thus, sir, I proved beyond dispute that my principle was right. Tenderly we placed the remains in the building which had sheltered it in its growth, and then to supper. I became generous before seeking my couch, and, had my promises been kept, one of the twain would have been somewhat richer than he is this day; but we cannot all keep our promises.

I knew that discretion was the better part of valour, so ere launching my invention upon the world I thought I would take time to consider; for although I had proved a principle, I had hardly reduced it to everyday life: thus it happened my pet invention gave me much trouble and much pleasure, as I was continually asked what the machine was, producing no end of mirth when I boldly stated that it would carry me 50 miles an hour.

I candidly state that hills have been my *bête noir*, and corners, sharp corners, troublesome affairs, otherwise something would have come of my thought and work; as it is, I am holding back in case a better man should step forward, still ready to prove that I can produce a velocipede that can go on level ground at the rate of 30 or 40 miles an hour.

Supposing you have obtained a machine which will do all you expect on the level, the next question will be to render it efficient in ascending hills. At this end of the question I found no entry; I therefore used my wings of fancy, and bore both myself and my machine to the top of the hill. As its own weight would be more than sufficient to take it down, my weight could be used to create a reserve force in the shape of a chamber of compressed air. By the use of a crank and piston this could be accomplished. The chamber being of what? I found upon consideration iron was the only material suitable for the reception of this compressed air. Here I had a good theory; but what with cranks and pistons, valves and chambers, my velocipede had become a weighty matter, so weighty as to be beyond my powers; for, had I been lucky enough to have had a down-hill always before me at the start, each hill I ascended must of necessity have been of less altitude. A rough road would undo me. My roads must be of the smoothest; and, in fact, the creation of reserve force, owing to the weight of material to receive this force, was not worth creation. A lever which acted in a small cog-wheel being a ridiculous theory was dismissed as soon as entertained; but how about powder? Here was an instant solution: grand idea! pile-driving gave me the key to the riddle. Here I am, then, perched on a seat 7 ft. high. I gradually descend turning the wheels of my velocipede by my own weight. I arrive at my lowest point: pop goes a charge of powder, and I am instantly projected to a 7 ft. throne. Again I descend, and again I am projected upwards. As I could also use my arms and legs for propulsion I had certainly hit the right nail on the head, but how long my head and frame could stand such jerks, I was, I flatter myself, too wise to try by actual experiment. Feeling that I was not equal to the solution of rendering the ascent of hills easier by some light and simple reserve or storage of waste power, I have confined myself to the construction of a velocipede, simple, light, frictionless (?), and of such construction as to allow me to throw weight as well as muscle into its motion on the level or up hill. In the ascent of hills all velocipedes fail; you push against yourself; in other words, you pull yourself up by strength of thigh; you push against the hill, which has a tendency to send you down one yard for every two which you ascend. Hence you not unfrequently see a velocipedist going up hill backward: his body by this means, being inclined at a less angle to the plane of ascent, assists him by its weight.

I cannot say my invention is even yet perfected. My first attempt was extremely crude; it nevertheless embodied an idea. It existed for several months, being the wonder, not admiration, of all who beheld it. The wheels were not ordinary ones, and attracted attention. The fact is, I had to forsake my barn. In the small hours of the morning, when most respectable people had sought their couch, my friend and I tenderly and cautiously guided the offspring of my fancy to a new house. Nothing but a garden wall shielded it from the vulgar gaze. Its bearing being decidedly too lofty under these trying circumstances, I determined to dismember it, and one chilly afternoon I did what I almost looked upon as a deed of sacrilege. In the commencement of this communication I hinted that the result of my becoming the inventor of a velocipede had nearly proved terrible. The Crimean war was then, or soon after, raging; and from the construction of velocipedes I turned to that of infernal machines. I made drawings, wrote reports, and through an M.P. introduced them to the consideration of the Lords of the Admiralty. I was kept in suspense some time, but eventually received a communication stating that their lordships had duly sat upon my invention, and could not recommend its adoption in her Majesty's service.

M. U.

SELF-SUPPORTING PRISONS.

THERE is a strange though unintentional perversity about the national treatment of criminals and paupers. In both cases the industrious ratepayers, while in too many instances overworked themselves, provide for able-bodied criminals and paupers, but especially for criminals, good food and lodging, with attendance, and nothing profitable to do. In the case of criminals, the utmost attention is paid to their sanitary welfare; and while their paymasters are stifling themselves and their families in stuffy back shops and unventilated underground bedrooms, lighted by dim "dips;" they provide for Bill Sykes and his friends well aired and ventilated, clean, tidy, winter-warmed, snug, and cheerfully-lighted places of abode, where, if they sing "We've got no work to do," it must be with a wink of the eye, if it is not with the tongue in the cheek. And Bill may well think what donkeys *his* breadwinners are! How long is this ridiculous and absurd system to continue? Not only ought both criminals and paupers to labour while able for their own food and lodging, but criminals ought to make restitution for the wrongs they have done. If criminals knew that in prison they must earn their bread like honest working people, they would soon learn to *prefer work with liberty, to work with imprisonment.* If paupers were called upon to provide for themselves and their families in *work* houses, there would be fewer suicides and family murders on account of starvation, because there would be less disgrace in the name of a workhouse than there now is. It is shameful that such is the state of matters, that the name of a prison is not more disgraceful nor more repelling than the name of a workhouse, if so much, and that so much better is the treatment of villainous criminals than the treatment of honest but unfortunate paupers, that there is thus an evident temptation of the starving poor to steal and so prepare for a prison, rather than go to a workhouse. The nation is thus truly inculcating—teaching—crime. In this money-worshipping age, to be poor is itself virtually a crime; and really, as bankrupt debtors used to be put into prison where criminals are put, it would be more consistent, and almost better, to do away with workhouses altogether, and send all paupers to prison. They might at least obtain treatment on a level with that of criminals, and not fare worse than they in all respects.

On the subject of self-supporting prisons, there is an able article in the *Christian Times* of November 12th, from which we shall quote a few passages:—

"The State prison of Massachusetts returns a clear revenue of 5,000*l.* per annum to the State, after paying all costs and salaries. Many French prisons are nearly self-supporting. Even in the distant Antipodes the gaol of Dunedin, with 789 inmates, defrays all its charges by the profit of its prison labour, and returns a surplus of nearly 1,400*l.* In France, the prisoners are provided with lodging, bread, and water, by the State: what further is needed must be earned by their own hands, opportunity

being given. Why should it not be so here? Because the House of Lords Committee in 1863 reported against remunerative prison-labour, contrary to the evidence of the two experienced prison inspectors and many able officers; and the 1865 Act carried into effect their lordship's views. Will the ratepayers of Middlesex and other counties cheerfully permit their pockets to be thus lightened to support strong and lazy criminals, merely because such a system has once been agreed to by a Lords Committee?

It is a question which materially affects the morals of the kingdom, the security of property, and the county rates. The chaplain of a self-supporting American gaol last year visited this country and inspected its prisons. On his return he published the result of his observations, and after remarking 'I was greatly surprised in my visits to learn how very little the prisons in Great Britain generally yield to their own support' (about 1½d. per day per head), he states that he was told that the present system was considered more 'deterrent.' He adds, 'I asked if this was the practical result of the course, and was assured it was not; for that the number of recommittals was large—not less than 39 per cent.'

During the past three years the London Howard Association, for the diffusion of information on criminal treatment, has widely aroused public attention to this question, and much progress has been made, considering the restrictions of the prison laws. At Wakefield Gaol the inmates earn about 8,000*l.* per annum, chiefly by mats. At Holloway nearly 1,000*l.* have been received in one year for tailoring (officers' uniforms) done within the walls. At Bedford Prison the inmates earn about 600*l.* per annum. Manchester New Bailey, Preston, Durham, Newcastle, York, Birmingham, Hull, Petworth, Liverpool (borough), Devonport, Leeds, Chester, and other prisons are also making much progress in this direction. It is found by experience that useful labour may be rendered quite as punitory and deterrent (by means of task-work) as the hardest treadwheel exercise; and, indeed, far more so. The governor of Devonport gaol recently related to Mr. Tallack, Secretary to the Howard Association, an incident which well illustrates the effect of requiring prisoners to contribute towards their own maintenance and punishment. A vagrant, who had been confined for a fortnight, was obliged to work at hard but useful labour in his cell; and on his discharge the governor informed him that his earnings during his imprisonment had amounted to double the cost of his food, 'so that you have also contributed so much towards my salary.' This was quite a new idea to the vagrant, who at once perceived that he was making a fool of himself by entering a gaol where he must compulsorily pay for his own punishment, in addition to his support. He replied, 'Then you shall never see me here again.' And he has kept his word. Nor is this by any means a solitary instance. Let this plan be more extensively adopted, a greater variety of prison industry enforced (in lieu of the too general mat-making), and a more practical prison legislation enacted, and the result, instead of increased prisons, will be not only diminished rates, but also a most gratifying reformation of criminals as a class."

HOLKHAM CHURCH, NORFOLK.

This church, after having been closed for the last eighteen months, was re-opened last Tuesday, the 14th inst., by the Bishop of Norwich. It has been restored, and many portions, where necessary, rebuilt, at the sole expense,—amounting to about 9,000*l.*,—of the Earl of Leicester. The church previously to the late works was in a lamentable condition, having been plastered both inside and out, and the roofs concealed by plaster ceilings. Many of the windows were bricked up, and plaster panels substituted upon the walls inside. The walls of the tower, as well as many other parts, were in a very unsound condition. In the restoration the plaster casing has been removed, the stonework renewed, where necessary, and new windows were inserted where the old ones had been destroyed. The east end of the chancel has been rebuilt, with decorated buttresses and five-light windows of geometrical tracery. The tower, which is attached to the south aisle, has been underpinned, and the south wall taken out and rebuilt as high as the belfry windows. The lower portion is of the thirteenth century, and there was sufficient evidence to show that the entrance to the church was through a large double door; but it had become nearly obliterated by alterations and repairs. A new double door has now been added, with a centre clustered shaft and arch mouldings, enriched with dog-tooth moulding. A new open-arcaded stone staircase leads to the ringing-chamber.

The whole of the roofs of the church and chancel are new, of pitch pine, and have carved ribs resting upon stone carved corbels. The west window, which is new, as well as the east window, is filled in with grisaille glass by Messrs. Lavers, Barraud, & Westlake; the west windows of the aisles have stamped grisaille glass by Messrs. Powell & Sons.

The pulpit is of Caen stone, with foliated panels and capitals, supported on polished red granite shafts. The seating is of oak, and every bench-end is enriched with carved arm-rests and tracery panelling, containing carved representations arranged conventionally from nature, embracing a great variety of designs — every bench-end being different. The lectern consists of an oak double desk of a pyramidal form, with carved ends and diapered surfaces, supported on a carved twisted oak central shaft, surrounded by four other carved shafts at the base.

The font, which is situated at the west end, opposite the west door, is of Caen stone, with bason enriched by carved panels containing the emblems of the four Evangelists, carried on nine polished red granite shafts, with rich foliated capitals. The chancel aisles, which are open to the nave and chancel, are separated by carved openwork screens executed in oak. The spandrels and other portions contain a variety of designs, carved on both sides of the screens, arranged—with an admixture of birds—from natural foliage. The reredos, consisting of an arcade of enriched trefoiled arches, with foliated spandrels embracing among other subjects from nature the lily and passion flower, is executed in Caen stone, with polished red granite detached shafts. The floors of the church are laid with Maw & Co.'s tiles, and the communion space is laid with a combination of marble and tiles, by Messrs. Simpson & Co. The whole of the work has been carried out by Mr. Robinson Cornish, of North Walsham, from drawings and under the superintendence of the architect, Mr. James K. Colling. The iron work is by Mr. John Parlour, of Norwich. A peal of six bells has been put up in the tower by Messrs. Warner & Son, the tenor weighing 20 cwt.

A WORKING MAN ON EDUCATION.

Sir,—For at least forty years many leading minds have mourned over the ignorance of the masses, and devised schemes to remedy the deficient education of the people. The question is once more becoming interesting; and perhaps in these latter days the education of the working classes will receive that attention which so mighty a matter deserves. Already two great organisations are formed, and have begun to agitate the question; and it now becomes a matter for consideration as to which is most worthy of public support. I read with much interest the programme and proceedings of the National Educational League, and I felt the conference was in earnest; and I believed that, to make the movement successful, it required the earnest support of all who believe in the necessity of a permanent provision for securing to the great body of English people the means of early moral and intellectual culture. Without quoting educational statistics, it is well known that millions of our fellow countrymen are debarred from all intellectual pleasures. They feel no interest, and can take no part, in the great questions of the day. Their pastimes are grovelling and degrading, and their highest aims sensual gratification; and it is appalling to know that millions are still growing up in the like condition. It appears to me that it is a public duty to support the National League, as the members and council are for immediate action. Ever since the question of national education has been agitated, there have been alarmists, whose prophecies have been most doleful, and all sorts of things were to happen when the working men had become educated. The present movement is no exception. Priests, clergymen, and laymen, Liberals and Conservatives, have met at Manchester, and inaugurated an opposition scheme: they state, which is no doubt true, that a good deal has of late years been done in the way of education; and if they are let alone, they will do a great deal more. But whether they are left alone or not, they intend to oppose with all the forces at their command the Birmingham godless plan to make all the working classes atheists. When the late Lord Brougham forty years ago proposed a scheme for the education of the poor, he was assailed by various writers as one who was going to turn the country upside down, and create a nation of atheists. A country gentleman of that time, in a letter to Lord Lansdowne, to show the consequences that would ensue if the theories of Mr. Brougham were to be put in force, among other things said,—"Unwilling as I am to trespass further upon your lordship's patience, I cannot resist calling your attention to a few further observations which occur in opposition to this baneful project. Suppose, for instance, that some friend to humanity were to attempt to improve the condition of the beasts of the field: to teach the horse his power, and the cow her value; would he be that tractable and useful animal he is, and would she be so profuse of her treasures to a helpless child? Could anything be more impolitic? Yet there is not, that I know of, any express law against it; nor would it be one jot more ridiculous than teaching tailors and cobblers 'the beautiful system of geometry.'"

In the year 1820, Mr. Brougham, in the House of Commons, moved for leave to bring in a Bill for the education of the poor in England and Wales. He said there were at that time 2,750,000 children that ought to have been receiving an education. Of that number, 750,000 were receiving an education, and 2,000,000 were totally unprovided for; in other words, every fifth person was without the means of education; so that the then condition of "Switzerland in respect to education was twelve times better than our own." Since that defeat of the friends of national education in Parliament, forty years have elapsed, and the difficulty is almost as great as it was then, and friends to education are still obliged to state that England, which ought to take the lead in all that is intellectually great, is still, so far as the bulk of her people are concerned, almost the worst educated country in Europe. It is a well-known fact that Parliamentary grants for educational purposes are increasing year by year, and yet the people are not educated. It has been clearly shown that, under the present system, the districts most requiring help have not, from a variety of causes, received any benefit from the grants; one cause being the low estimate of the inhabitants of the poor districts of the value of education; and, as no system of compulsion is in force, the young are left to street education, whilst the fat districts get all the educational grass, and the poor are left to starve; while education, the key to national prosperity and well-being, is blighted for want of a compulsory system to keep it in motion. When one remembers how little was taught in working-class schools twenty-five years ago, and how few our educational wants were supposed to be, it appears to me that for all those who, like myself, have retained the little we then learned, there is work for us in supporting the National Education League; and determining that England shall have as good an educational system as other nations possess, and that it shall not be left to the caprice of voluntaries or any other class to mar its progress; so that it may no longer to England's disgrace be said that her working classes are the worst educated of all the progressive nations in Europe. It is a foul blot upon the national escutcheon; and, in spite of all obstacles, it is to be hoped the earnest friends of the movement will not rest until it is wiped out, and a universal system takes its place.

I hope the above remarks of a working man will not be out of place in the columns of the *Builder*, and that in another letter I may be allowed to state my reasons for supporting the programme of the League in preference to the one proposed by the Manchester Educational Union.

Jack Plane.

BUILDING OPERATIONS IN THE YORKSHIRE COLLIERY DISTRICTS.

The building trade in the Yorkshire Colliery district has, during the past few years, been largely indebted to the opening out of new coalmines, for a good share of the prosperity which it has received, and which it still enjoys. This important branch of the trade seems to be almost entirely overlooked, but there can be no doubt that to it the builder is largely indebted for the numerous small towns which spring up in districts where new coal-fields are being opened out. On the other hand, the builder is also one of the most important artisans that are to be found about a new colliery where engine-houses, &c., are sure to be needed. The Yorkshire coal-field is of a very large extent, commencing as it does not far from Nottingham, and extending near to Normanton, a distance of about 70 miles. It would be more appropriately known by the Midland coalfield. It is, however, to the Yorkshire coal-field proper that we more particularly refer, and in which within the past two years some thousands of pounds have been expended in building operations connected with new collieries alone. Many of the engine-houses and colliery offices are no mean specimens of architectural skill or workmanship. We have first to notice the very beautiful works at the Denaby Main Colliery, which is not only the nearest to the magnesian limestone formation, but the deepest pit in Yorkshire. The engine-house is a large and well-constructed building, and supplied with two beautiful engines, each 100-horse power, which were made by Messrs. Bradley & Craven, of Wakefield. Eight large boilers are also fixed on the premises, and are set on a new principle. The shafts are 13 ft. 6 in. in diameter, and are partly walled with brick and partly "tubbed"

with metal plates. The offices and manager's residence are a fine block of buildings. In addition to these the company have also just completed about 150 cottages on the pit premises for their workpeople, who number between 500 and 600 hands. About two miles nearer the centre of the coal-field,—viz., at Wath,—a very large undertaking is now being opened out. The new project, which is to be known as the "New Manver's Main Colliery," will be one of the largest pits in Yorkshire, and has involved a very large sum in building operations. Here the visitor and admirer of neat and substantial workmanship and design will amply be repaid by a visit. The engine-house is a very large and commodious one. It is to have an open roof, similar in design to those in churches. The whole will be boarded and polished, which will give the building a neat and healthy appearance. Two of the largest engines in the district are now being fitted by Messrs. Black, Hawthorne, & Co., of Gateshead. Each is 180-horse power, and can, if needed, be worked up to 200-horse power. The shafts—an upcast and a downcast—will be nearly 300 yards deep; and these, with the exception of 50 yards, are walled all round with bricks. Nearer Barnsley, the Oaks Colliery Company are also sinking two new shafts, which are now about 140 yards deep. Here, also, a very neat engine-house and other buildings have been erected, which have found a good deal of work for masons. At Mearsbro Dyke, the Darley Main Company have sunk new shafts, and are building engine-houses and offices, which for style and finish cannot be excelled. At Burton Bridge, near to the Cudworth Station on the Midland line, a large plant has been fixed, and sinking operations are going on rapidly. In the West Yorkshire coal-fields there are at the present time a number of new collieries being opened out, which are finding employment for a large number of masons, &c. At Featherstone, a new coal-field is being opened out by Messrs. Shaw & Co., who have erected a handsome engine-house, which has just been finished by Messrs. Tattersall & Horsley, builders, of Featherstone. In the Normanton and Castleford districts, great improvements have been made, and whole streets of buildings have sprung up within the last two years, in consequence of the opening out of the numerous new collieries, which are to be further augmented in a short time.

NEW MASONIC HALLS.

Durham.—The new hall which has been erected in this city in connexion with the Marquis of Granby Lodge of Freemasons, has been formally opened with the rites and ceremonies of the Royal Arch Chapter. The new hall is situate in Old Elvet, opposite the Court Houses, and the foundation stone was laid on the 22nd December, 1868. The building has been designed by, and the work carried out under the care of, Mr. T. C. Ebdy, of this city, architect. The style of the architecture is Early Geometrical Gothic. The front façade, which is not very extensive, owing to the limited site, is executed in dressed ashlar from the Brasside quarries. The principal entrance is formed by four polished red granite columns supporting a bold pointed arch, above which is a large bay window, which is formed by cusp lights, and the spandrels are filled with Masonic devices. Over the entrance is carved in stone "The All-Seeing Eye," surmounted by crosses formed of intersecting triangles. The portico leads to an ante-room, 21 ft. 9 in. by 16 ft. 3 in.; and a corridor, 11 ft. wide, leads to the principal staircase and banqueting hall. The hall, which is 46 ft. 3 in. long by 25 ft. 5 in. wide, and 15 ft. high, is lighted from the east by two three-light pointed windows, warmed by open fires, and ventilated by a system of syphon tubes. Adjoining the hall are the steward's room, lavatory, and wine-cellars, &c. Between the ante-room and banqueting-hall is a triple staircase, leading to the lodge-room on the left, and to the robing and preparation-rooms on the right. The lodge-room is approached by an ante-room (or tyler's room), through a pointed Gothic doorway supported by semi-detached columns, with carved capitals. In the tympanum of the arch, carved in bas-relief, is a figure representing Moses descending from Mount Sinai with the tablets. The lodge-room is the same size as the banqueting-hall, and 30 ft. 9 in. high to the apex; the roof is open-timbered, the principal forming an arch. All the woodwork is wrought, stained, and varnished.

Halifax.—The Freemasons' Hall in Halifax has been formally dedicated to Masonic purposes by Earl de Grey and Ripon. It is in the Italian style, having in the front a projecting portico of 7 ft. 6 in. The large room, which is on the principal upper floor, is 48 ft. long by 24 ft. wide, and 24 ft. high, and is enriched with a coved and panelled ceiling, with ornamental marginal counter lights. The walls are divided into compartments by pilasters, having carved bases and capitals, and a Corinthian cornice with full enrichments. The east end is adorned with a large canopy, supported by two pillars with carved capitals; and the west end of the room has single columns, forming central projections. This room is approached by a spacious staircase of stone, and opposite the foot of the staircase is the entrance to the dining-room, which is the same size as the lodge-room, except that it is only 14 ft. high. The interior also contains instruction and other rooms, for both the lodges of Probity and St. James, together with smoking-rooms, cloak-rooms, lavatories, &c.; and the basement contains living apartments for hall-keeper, with requisites for cooking, &c. The architects were the late Mr. J. E. Oates, Mr. B. W. Jackson, W.M. of Probity, and Mr. W. H. D. Horsfall. The cost of the building is about 4,254*l.*, exclusive of furnishing, which is calculated to cost 500*l.*, so that when completed the entire cost will be 4,754*l.*

AN EFFORT FOR ARCHITECTS' ASSISTANTS.

SIR,—The interest which you appear at all times to take in everything which may conduce to the advancement of the architectural profession impels me to request the insertion in your valuable paper of a few remarks upon a very important question; namely, the *status*, social and professional, of the class of architectural assistants. I am not of those who would claim for assistants some share of the honours of the practising architects in whose offices they may happen to be; but I do think that an assistant ought to be looked upon as something less of an inferior being, and as something more of an equal, and a fellow-worker in a noble emulation, and more especially as a gentleman, by profession, at least, if not otherwise.

But my more immediate purpose in addressing you, sir, is to propose the formation of an association for the social and, still more, the *professional* advancement of architectural assistants, and to ask for your kind assistance, and that of the profession generally, in what I believe to be a proper and praiseworthy object.

I would propose an Association of Architectural Assistants; that its great centre of operations should be in London; and that there should be branches in every town in the kingdom; and that as early as possible it should be extended to the Continent. The branches to have direct intercommunication with each other, and with the London centre, and to have a direct voice in the government of the association.

The present objects of the association should be,—1st, the drawing up of some standard of qualification for an architectural assistant, and for a practising architect; 2nd, the advice and pecuniary aid to assistants out of employment; and, 3rd, the professional advancement generally of the class of architectural assistants, and such others as might afterwards be thought suitable.

For the first of these objects a sufficient reason may be found in the numbers of assistants and practising architects who, neither by nature nor by education, are fitted for the positions they occupy.

As to the second, I may ask a question which seems to puzzle every one: what becomes in old age of assistants who have not the means nor the opportunity to commence to practise, and so gain themselves a competency? Their salary as assistants will allow very few of them to retire altogether.

The third object requires further explanation. Generally, the assistant has to work close at his desk eight or nine hours a day, and very often eleven or twelve hours. Many of them have not the Saturday half-holiday at all. The rest very often, even if they nominally have it, have it not practically. This long and close application during the day is so severe, that the assistant can neither have the power nor the inclination, in the evenings, to enter into those more refined studies of art, through which alone he can hope to make himself worthy of his profession. The greater part of the bright day of his life he is a slave; how can he, in the dark and drear evening, "when no man can work;" how can he labour and toil to become a master of his art, a worker in and a lover of art? The mechanic, the artisan, and the working men generally around us, are having their daily toil shortened, and time given them for self-improvement; but the architect's assistant, the professional man, and the worker in art, forsooth, stand still. Is architecture a profession and an art? It is because I believe that it is, that I would seek for its advancement to its proper position, and would ask every earnest worker in it to labour to obtain the art-education and knowledge of the architectural assistant. Let the office-work of the day be limited. To the shame of the practising architect be it said, there is but one way to obtain this, and that is the offensive and defensive union of assistants. Of all arts and professions, architecture surely pays worst, *as far as the assistant is concerned.* But this is an unpleasant part of my subject, and may well be left to your readers.

As to the social position which an assistant occupies in an office, I would remind practising architects that, if architecture is a profession, the assistant, as such, is socially equal to themselves, and ought to be regarded and treated as such. Very often outside the office the social rank of the assistant is superior. At least, let both of them remember, at all times, to behave as architects and gentlemen.

I have written these few remarks with the hope that some abler man, and some abler pen, will espouse the cause, and will help to stir up the architectural mind to the consideration of this important matter. If the assistants will unite, they must obtain that which is justly theirs. And here I would yet deprecate all such pressure being brought to bear as is unhappily being done by trade-unionists. I would simply say, let the architect's assistant conduct himself always as one who believes himself to be a member of an honourable profession, and as an Englishman and a gentleman.

AN ARCHITECTURAL ASSISTANT.

THE SEWAGE QUESTION AT WATFORD.

AT a recent meeting of the local board of health, the clerk read the report of the committee (accompanied by Mr. Lovejoy, the surveyor) appointed to visit Stroud, and inspect the system of sewage deodorisation and utilisation adopted there. The report, which was signed by all the members, recommended this system to the consideration of the Board. The clerk read a letter from the secretary to the Stroud Sewage Company, to whom the patent belongs, stating that the royalty which must be paid by the Board for permission to adopt the Stroud system would be 50*l.* a year, and one-fourth of the profits on the manufactured manure. The directors of the company would give such instructions as would enable the Board to render the affluent water as pure as that of Stroud.

An elaborate and able report by Mr. Lovejoy on the same subject was read by the chairman. The report stated that the Stroud system involved an expenditure of 250*l.* a year. Neither the tanks nor the levels belonging to the Watford Board were adapted to the process, and he estimated the cost of adopting the Stroud system at 1,150*l.*, in addition to the working expenses. The quantity of sewage at Stroud was less than one-third that of Watford, without taking into account the London Orphan Asylum and the increase of population at Watford. He calculated the working expenses at 750*l.* per annum, and to that must be added the interest on the original outlay, which would make a total yearly payment of 820*l.*, in addition to the royalty. With regard to the sale of the manufactured manure he was not at all sanguine, after seeing the quantity on land at Stroud; and, although the quantity of sewage at Watford was much greater than at Stroud, there would not be a much larger amount of manufactured manure. The estimate of the expense of adopting and working the Stroud system contrasted very unfavourably with that of the scheme proposed by Mr. Catlin (one of the committee), which was from 360*l.* to 400*l.*; while, as regards the return for outlay, irrigation was far more likely to prove remunerative than deodorisation or precipitation. At places where the irrigation system had been adopted it was stated that they were realising sums of money, the lowest of which would amply cover the working expenses and the interest on the outlay. It was the opinion of

many scientific men that all processes of deodorising sewage, except the application of earth pure and simple, rendered it nearly if not quite valueless as manure. If the Stroud system were adopted at Watford, it would be necessary to separate the sewage from the storm-water. At Leicester, after ten years' trial of the deodorising process, and a loss of 12,000*l.*, the Board of Health were now about to adopt irrigation. In conclusion, Mr. Lovejoy said he could not advise the Board to adopt the Stroud system. He believed that in the course of a few years the value of the application of sewage to the land would be better understood, and there would be as great a competition amongst farmers to obtain it as there is now a difficulty in disposing of it.

RAILWAY MATTERS.

While the Metropolitan Underground and the Metropolitan District companies seem both to meditate the repudiation of their obligations to extend their lines to the east of London, uniting them at the Tower, a new company is being started for the purpose of obtaining an Act to enable them to form these same extensions, and combine them with further extensions. The scheme is one to incorporate an East and West Metropolitan Junction Company, which proposes not only to complete the "inner circle," but to extend the Metropolitan District Railway to Bow, to connect both Metropolitan lines with one another, and with the Great Eastern, the North London, and the East London, and to make a central station for east and west near the Mansion House. This larger extension of the scheme already authorised would probably be more profitable than the mere extensions to Tower-hill, as it would unite the whole east and west of London in one great system.——At a recent meeting of the North Eastern Railway Company in the North of England, the chairman said, "several years ago, when the company was prosperous, the directors pledged themselves to the public to reduce the fares to 2d. per mile for first-class, 1½d. for second-class, 1d. for third-class; but falling on adverse times, it was decided to postpone the reduction. Now that the company was again prosperous, the directors felt that the reduction could be no longer delayed." The fares on the Newcastle and Carlisle section have been particularly oppressive on the travelling public. This line opens up some of the favourite places of resort for both the tourist and the excursionist.

HOUSE BUILDING AND BUYING.

Your correspondent, "J. M." adverting in the *Builder* of December 4 to the unsanitary condition of the houses in certain "terraces, places, and villas" in the suburbs of London, has described a state of things which no doubt exists largely. In his estimate of the causes which have led to the building of houses such as those described, however, I venture to think that "J. M." is to a great extent mistaken; whilst he is certainly wrong in concluding that the class of persons who occupy these houses is at all at the mercy of either landlord or builder.

It is true that the circumstances under which the trade of the "speculative builder" is too frequently carried on may often cause economy to degenerate into "scamping;" but the faults in principle, and in arrangement, indicated by your correspondent—together with many others of varying character—as frequently arise from ignorance on the part of the builder as from the desire to save money.

The fact is, that many of these "terraces, places, and villas" are built, and the work personally directed, by men who have never previously had any experience in building, but who, encouraged by the prospect of "advances" held out to them by ground-rent-creating speculators, go into business as builders.

Now, sir, building being a business the conducting of which in a proper manner necessitates the possession of a large amount of very varied knowledge, in combination with much practical experience, I do not think that it is in the least degree remarkable that tailors, shoemakers, and publicans, or even smiths, painters, or other mechanics, who have possibly worked almost exclusively at one branch only of the building trade, should not be able to secure this knowledge by simply assuming the title of "builder."

It may, perhaps, at times occur, that men who really do know better, but who are building side by side with such builders as those above referred to, are rendered careless by knowing that they will have to "sell" at the same price as their neighbours; but this is of comparatively rare occurrence, and would cease at once, and for ever, if tenants and purchasers were disposed to stop it. The simple and obvious remedy is, for those about to rent or purchase a house, to employ a respectable surveyor to report upon it; but in the course of a rather long experience, I have found that it is quite an exception for this precaution to be taken, even by persons who are not in other respects negligent.

As soon as it becomes the rule to employ a competent and independent surveyor before purchasing, or otherwise incurring responsibility in connexion with house property; the erection of houses such as those described by "J. M." will no longer afford even the slightest hope of a profit to the builders of them, and therefore the trade must collapse for the operation of the natural laws which influence any industry so situated.

Enlarging the powers of district surveyors, and inspectors of nuisances as suggested, or even the indefinite multiplication of those very useful officers, would effect but little in the required direction, so long as houses may be sold or let, as they now frequently are, by the simple expedient of papering the walls in an agreeable manner.

In conclusion, I have to state my conviction, that respectable builders who know their business, would be extremely pleased to see such a common-sense plan universally adopted, whilst the would-be tenant or purchaser would, by paying the small fee which a surveyor would charge him, frequently save very much money, and sometimes avoid illness or possibly death.

A Builder.

FALL OF A MILL AT BRADFORD.

In the vicinity of Park-road, Bradford, Osborne Mill has fallen in. It was built about six years ago. The building consisted of three floors. Above the third floor was placed a large tank or cistern, which has been the cause of the destruction. The cistern extended the whole length and breadth of the building, and was about a foot high, being intended to hold 10 in. of water. It was to supply the boilers and the premises generally with water. The sides of the tank were bound with iron, and it possessed a leaden bottom. This tank has for some time been observed to stand in an unsafe condition. The tank broke through the two first floors that intercepted its progress, and carried all before it to the ground. Fortunately all who were in the building succeeded in securing their safety before the fall took place; but though no lives have been lost, the accident has been of a disastrous character. The interior and part of the sides of the building (which was 70 ft. long and 24 ft. broad) have been destroyed. Three machines, valued at upwards of 200*l.* each, and 300*l.* worth of press paper, have been rendered useless, and a large number of pieces have been seriously damaged. Two of the machines were not working, and the workpeople were thus enabled to hear, what they could not otherwise have done, the first warning of the crash.

INDIAN ART WORKS IN BIRMINGHAM.

A collection of East-Indian works, selected from the Indian Museum, Whitehall, is now being exhibited in the Birmingham Corporation Art Gallery; and Mr. W. C. Aitkin, who is always to the fore when he can serve the cause of art, has written a very useful guide to it, which is sold at 1d., and materially increases the value of the collection. At the conclusion Mr. Aitkin says,—

"Viewed with intelligence, these examples, their teachings properly understood and applied, would go far to correct the vulgarities recognisable in the art-manufactures of England, France, and other countries. In the metal, ceramic, and textile manufactures of India can clearly be traced those invaluable rules of art, a proper definition and recognition of which form the great want of our more civilised industrial systems, more especially as regards the elements of truly appropriate designing for articles of manufacture, in which youth and beauty go hand-in-hand. This want is not recognisable in the manufactures of India.

In a commercial point of view, the contents of this collection may be rendered useful, apart from the purposes which have been pointed out. With the intention of encouraging the manufacture of textile fabrics for export to India, and with the cognizance of its Council of State, Dr. J. Forbes Watson (who made the selection from the contents of the East-Indian Museum now exhibiting here) wrote and published, in the year 1866, a most able and interesting volume on 'The Textile Manufactures and the Costumes of the People of India.'"

"Now, it does occur to us, in glancing over the objects now open for exhibition in the Corporation Art-Gallery, that, that which has been done for manufacturers of textiles ought to be done for our own manufacturers of hardware."

Mr. Aitkin thinks that the objects which form the Indian Collection now exhibited there should be supplemented with others from the East India Museum; and that the Council of State for India, by a permanent gift of these, will only be doing a graceful act, and that which has been done for the manufacturers of textiles. These objects would form a most excellent addition to a Free Industrial Museum, which Birmingham *must have*, and would afford its manufacturers the opportunity of entering the East Indian markets, did they see it to their advantage to do so.

LIGHT AND AIR.

A PLEA FOR THE POOR.

Give to crowded lane and court
Light and Air.
Give to all, for life's support,
Light and Air.
To the toiling craftsman pale,—
To the poor on half a meal,—
To the workhouse and the gaol,
Light and Air.

Hear our gasping children cry,
Light and Air.
Give us, Lord, or we shall die,
Light and Air.
Rend Thy clouds and let Thy sun
Shine on homes by plague undone;
Give to each and every one,
Light and Air.

Why will man withhold from man
Light and Air?
Is it not a crime to ban
Light and Air?
Give our city's darkest spot,—
To lorn creatures long forgot,—
To brain and brow with fever hot,
Light and Air.

Give to hut and hall forthwith
Light and Air.
"Let there be light," said Holy Writ;
Light and Air.
Come, Hope, and cheer the wan and frail,
That Heaven's judgment may not fail;
Blest health, blest health—All Hail, All Hail,
Light and Air!

EUSTON SQUARE.

Sir,—In reply to your correspondent, "S.," the works now being executed are to form a carriage and footway approach from the Euston-road to the Portico in Drummond-street. The only buildings to be erected, are two lodges, and the deep digging is to form an underground passage of good width and height for the frequenters of the gardens, to pass from one side to the other. One who knows the Work.

THE JOINERS' TRADE.

Sir,—The remarks of your correspondent "Query," in the *Builder* of November 20th, has, in a great measure, solved a difficulty to those of your readers who could not account for the high rents and increased value of house property all over the country. His statement is a fair explanation of where the 35 per cent. goes, and also accounts for the fact of finished joiner-work being imported from Sweden at less cost than it can be manufactured at home.

I do not labour under the same disadvantage as your former correspondent, who states that he is merely a spectator. Having been nearly thirty years an operative in the joiner department of the building trade of Glasgow, I have had an opportunity of observing all the different phases of the trade-union, some of which I heartily support, others as firmly detest, as tending ultimately to ruin our home trade.

Blood-money, referred to by your correspondent, was never understood to be paid to foremen or for the purpose of "driving" men, but rather for putting on men. I will describe it, and your readers will easily see the effect on the cost of building between twenty and thirty years ago and the present time. At the time referred to it was often the case that some of our leading hot-headed unionists would leave our ranks and become contractors and employers; but seldom were their views modified by the change; they were only transferred from the side of the workmen to that of the employers. It was these hot-headed men who introduced the tyrannical system of paying blood-money, which was carried to a great extent. The method of doing it was this:—In a squad of, say, from twenty to forty men, the employer would select a pair of ready-handed go-a-head fellows, and pay them a few shillings a week extra. These were generally put to doors and windows, or such work that several pairs could be put to the same quantity of work at the same time; then the blood-suckers proved their value to their employers by putting on the ordinary-paid men, and those that were left behind either had to submit to a reduction of wages or leave the work. This state of things induced many to become unionists who were not otherwise favourable, except to get rid of these oppressors. The first effort made was to agitate for a

uniform rate of wages, whereby the good and the bad, the fast and the slow, workman, would be paid the same wages. This was so far a success, as it was agreed to by the good men and zealously supported by the inferior men; but it did not prevent the employers paying blood-suckers as before, which still showed who were the good men. The next attempt was more successful. In the squads where the system of blood-sucking continued, a contribution was raised among the workmen for the purpose of paying the foremen to stay their hands. For a time it was known to be the case that these men received blood-money from both their fellow workmen and their employers. This did not last long. The employers seeing all men work a'ike, the blood-money ceased, and workmen became more comfortable; and now the other extreme has been reached, as illustrated by "Query," in the case of the union visitor, and that of the workman not being allowed to do more than his neighbour; or if he does the place will soon be made too hot for him. There is now no need for blood-money. If a man does more than is considered right by his shopmates, a meeting at the next meal-hour will put it all in order, or he will be reported.

On one occasion I saw a decent conscientious shopmate persecuted at the instance of an apprentice who worked little himself, and annoyed others who were working beside him. This man spoke to him in a very friendly way, and concluded by telling him that he was acting the part of a very mean robber towards his employer. The boy received the advice in a very different spirit from that in which it was given, and represented to his shopmates that this was a master's spy; and he was watched, annoyed, and his tools destroyed, and sand put on the wood he had to dress, till he left the trade in disgust, and is now carrying on a small business in another trade.

If workmen continue to limit the quantity of work to be performed by each man, as has been done for some time past, we shall very soon see joiner's work brought from Sweden to Glasgow as well as to London. J. H.

CATASTROPHE, CALEDONIAN RAILWAY TERMINUS, EDINBURGH.

SIR,—I am glad that your correspondent, "Observer," has drawn attention to the recent catastrophe at the New Station here. Although there has been fortunately no loss of life, still it is surely an important enough matter for a Government inquiry, quite as much so as the bursting of a boiler, or the stranding of a clipper tea-ship.

That a building of such magnitude, intended for the use of the public, should come down with a run, after a few squares of slating had been put upon it, is surely a subject for serious consideration.

The theory that a broken casting, or faulty tie-rod caused the complete downfall of a roof, covering a space 450 ft. by 72 ft., is of course sheer nonsense.

The building stood upon piles: the more need for careful bracing of the superstructure. These piles, it is stated, have not moved. I have no reason to doubt it; but it is the more evident that there has been some frightful carelessness in designing the roof and supporting pillars. The shed is now in process of reconstruction. Before it is finished and opened for traffic, the public mind ought surely to be set at rest as to its stability and safety.

AN UNFORTUNATE SHAREHOLDER.

CASES UNDER THE METROPOLITAN BUILDING ACT.

NOTICE FROM BUILDERS.

At the Marlborough-street Police-court, a summons was taken out by Mr. Kerr, district surveyor of St. James's, against Messrs. Strode & Co., patentees and manufacturers of sun-burners, 19, Osnaburgh-street, for neglecting to give notice of alterations and to pay certain fees claimed by Mr. Kerr.

The committee of the Army and Navy Club, in Pall-mall, decided upon making a new smoking-room in the club, the plans of which were prepared by their architect. The builders gave notice to Mr. Kerr, the district surveyor of St. James's, under the 38th section of the Act, of their intention to commence, describing the alterations as "a new staircase, wall, piers, and flues," and Mr. Kerr, from time to time, inspected the progress of the work. The contract for the supply of the sun-burners had been given to Messrs. Strode & Co., the manufacturers and patentees of that article, who fitted them up at the time the alterations in the room were going forward. Their contract with the committee of the club was entirely distinct from that of the builders; and whether they were therefore to be considered as bound to give notice under the 38th section of the Act, and pay a separate fee to the district surveyor, was the question to be decided.

Mr. KNOX, in giving his decision, said that to allow the contention of Mr. Kerr to prevail would be to let in a very dangerous principle, and one that he could not believe the Legislature ever contemplated; for if he decided that a separate notice and fee were due from Messrs. Strode & Co., on account of their having a separate contract with the committee, every one who had such a contract, however trifling the work to be performed, would become liable for a separate fee to the surveyor. There was no doubt as to the importance of the decision at which he might arrive in this case, affecting as it did the interests of so many tradesmen, as well as the district surveyors. It seemed to him that the general principle he should keep in view was rather the protection of the public than the multiplication of fees. It was absolutely necessary, under the Act, that a proper notice should be given to the district surveyor, pointing out to him the nature of the additions or alterations in hand affecting any building. The only question was—who was to give this notice? Suppose that the builder who gave notice to the district surveyor chose to include in his notice other alterations in progress at the same time, but undertaken under different contracts, would not that be well enough? He was inclined to think so, inasmuch as there was protection for the public as far as the inspection of the district surveyor could secure it; and the builder who chose to include any alterations, additions, &c., would be answerable if there were any infringement of the law. There must, however, be *bona fides*, and the notice given must be clear and intelligible. He was inclined to think that was the correct view of the general principle, but in the present case he was not absolutely constrained to go so far as a decision on the general principle. In the present case it was by no means clear that Messrs. Strode & Co. were in the position of tradesmen "executing" works. They applied the sunlights, no doubt, and under the separate contract; but the builders in whose name the notice was given had the principal hand in fixing them. Then, again, as to the notice, and the terms in which it was framed. It was admitted that the attention of the district surveyor was called to the fixing of the sunlights, and all matters appertaining to the work. There was no concealment,—no attempt at concealment. Again, if the notice might be taken as somewhat too vague and general in its terms, it must not be forgotten that this notice was prepared by Mr. Kerr's own clerk, no doubt acting under perfectly honest motives. Mr. Kerr could scarcely challenge the sufficiency of a notice prepared at his own office, when it was clear no concealment was intended by the parties. The summons must be dismissed.

KEENE'S CEMENT AND PAINT.

SIR,—As there does not appear any satisfactory reply to "Painter" respecting the mode of painting "Keene's cement," allow me to suggest for the benefit of those concerned that it should be painted in the same manner as that recommended in my "instructions for the use of Martin's cement," as I believe that the same *modus operandi* will hold good in both cases. It is as follows:—The first coat to consist *solely of linseed oil. Body colour should be avoided.* My reasons for this are, all the "hard cements," when finished for painting, have a very fine surface, which is almost like glass, and has, consequently, very little disposition to absorb a sharp drying colour, such as that described by your correspondent. The *oil*, on the contrary, does not dry, but becomes absorbed all over the surface, and forms a "key" for the succeeding coats, and *prevents* the possibility of *peeling off*.

This mode is, I think, the most reasonable, and certainly in every way the cheapest that can be adopted, and I can confidently recommend it, knowing that wherever it has been followed it has never failed.

The succeeding coats can be put on at the discretion of the painter and according to what is required.

J. C. PART.

SIR,—We do not desire any controversy with our competitors as to the merits of the different hard cements; but since "A Clerk of Works" spoke of Keene's and Parian cements as identical, it was not unfair on our part to inform him of the difference between them.

The letter in your last number from the manufacturers of Keene's cement states that "A Clerk of Works" is probably correct in attributing the peeling off of paint from the surface of Keene's cement to dampness, and that this is likely to occur when the ground-work is not thoroughly dry. We must suppose, therefore, that there would be constant failure in newly-constructed buildings, the walls of which are generally in a damp state. Parian cement is not affected in the same way, and may be painted on with safety within a few hours after the work has been finished.

FRANCIS & Co.

BUILDING COMMITTEES.

SIR,—When the initiate read the decisions of building committees on the several topics of the day, or when they scan morning reports of "Yesterday's Board Meeting," how highly amused they must be. When half a dozen intelligent committeemen hold solemn conclave respecting the nature of the stone to be used in the erection of their parish church, they little think that all their ignorance, wormed from each individually and painted in its brightest hue, will be to-morrow in public print. Viewing the question as rationally as we can, it would appear that nothing but censure awaits, as a rule, building committees. What are their duties? Undoubtedly to superintend the erection of the building, from cutting the first sod until the last coat of plaster be dry. Their inability to judge between good and bad work prevents their exercising *just* control over the unhappy builder—for unhappy he is who succumbs to unrighteous judgment; and as they are bound to condemn at times to illustrate the power of authority, the natural result is that bad material is allowed to be used with an approving smile, while good sound work is cursed and condemned, and is the cause of the "once youthful locks now grey with age," standing erect on six old heads, and causing such indignation as they are sworn to resent on this bold and fearful man by—stopping payments. The architect? Of him anon. There is one point about a building committee that is highly satisfactory to all concerned with them, viz., their power of argument. Whether the phrenological development of a committeeman be entirely different from that of another man, or whether it is only that portion of the head which contains argument, I know not; but certain it is, that in the whole course of my professional career I have seldom met with a committee man who possessed the bump of reason. Intelligence, be it understood, is often largely developed (by the way, I am not a phrenologist), but reason "dwelleth in another sphere." So intelligent have I seen one at times, that he has called a brick a brick, and a stone a stone, but when finding that he was the possessor of so much information, I talked of lintels, rafters, tie-beams, spars, dogs, and the like, my amateur friend became seized with a violent fit of sneezing, which abruptly terminated our interesting interview. The architect is not free from annoyance by these six men of surpassing intelligence, but, on the contrary, is often perplexed and thwarted more than enough. It is not to be supposed for one moment that these gentlemen can understand a drawing, or yet make head or tail of it; even the addition to the quick committeeman's eye of his spectacles scarcely enables him to translate a single line out of the carefully-drawn plan before him; yet he suggests alterations. Again, removing his glasses for the purpose of rubbing and re-fixing them, he scans with professional scrutiny, a gem of an elevation, and understanding it little better than he did the plan, thinks he will wear the air and manner of a critic: so proposes with reference to the wall space—upon the division of which you prided yourself so much—some additions. Then does your whole frame tremble, and with clenched fist you feel as if with one fell swoop you could mow down your six commanders like so many blades of grass. Still it may not be, but wearing false smiles and pleasant graces, and fearful lest you excite their wrath and displeasure, you at once coincide with their every wish, and so ignorance wins the day.

These few remarks may have appeared frivolous and trifling, but they are none the less true. When we take into consideration that ten churches out of twelve that spring into existence in the United Kingdom are built by subscription, and that each must have a committee of superintendence, we may well wonder at their ever being built. Committees there unquestionably should be, but not for the purpose of directing or influencing the work. Canvassing subscriptions is their duty, and seeing that the money is properly used after they have got it. When an architect is chosen for the purpose of designing a building, he should have full power to act independently, nor look to any committee for advice; from the architect, and him alone, should the builder take instructions; and committees only hinder work by interfering, and in reality cause two-thirds of the differences that arise during the construction of a building. EDWIN S. FRANCE.

THE COLUMN OF THE COUNCIL, ROME.

MEN are hard at work on the Janiculum Mount, erecting the column intended to commemorate the present Council. It will take the shape of a Doric column on pedestal, surmounted with a bronze statue of St. Peter, and will be about 78 ft. in total height. The shaft will be formed of rare coloured marbles recently discovered at the Emporium; the base and capital being of white Carrara marble. The square pedestal will be adorned with four bas-reliefs, including a representation of the ceremony of opening the Council.

NOTES ON CAMPANOLOGY.

"RING on, ring on, ye merry, merry bells,
We love your music well."

SINCE my article on "The Bells and Quarter Chimes of Great St. Mary's" was printed in the *Builder* of the 4th inst., a friend has kindly sent me a copy of a new work, just published, on "The Church Bells of Cambridgeshire," by the Rev. J. J. Raven, B.D., of Emmanuel College, Cambridge, Head-master of Yarmouth Grammar School; and I must say it is a valuable contribution to the Campanology of England. On the present occasion, however, I will merely give one or two extracts which may be interesting to general readers:—

"Of course," says the author, "when bell-loving Elizabeth paid her great visit to Cambridge there was a grand jangling. On Friday, the 4th of August, 1564, she made her entry amidst the clanging of all the church and college bells in the town. Considering that there was not a decent peal in the place, the noise must have been intolerable. There could have been no merry ring of eight to divert the ear; nought but the Babel of the various representatives, chiefly of C, B, B flat, A, and intermediate demi-semitones. It would have driven an Elizabethan glee composer mad. 'Such churches as were negligent herein were afterwards called upon, and were fined, some 8s. 4d., some more, some less.' S. Mary's escaped the higher penalty, the churchwardens paying only 'ijs. iijd., to the Quens Almoners servant for not ringing at the Quenes coming.' . . . . .

And now, having reached a period at which Change-ringing begins to make its appearance, let us see a little of the rise and progress of this healthy and ingenious amusement. The first to reduce the art to a system was Fabian Stedman, a printer, resident in Cambridge, who is said to have printed his changes on slips of paper in his leisure hours, and taught them to his company in the tower of S. Benedict. 'Within these fifty or sixty years,' says he, writing about 1667, '*Changes* were not known, or thought possible to be Rang: Then were invented the *Sixes*, being the very ground of a *Six-score*: Then the *Twenty*, and *Twenty-four*, with several other *Changes*.' ['Tintinnalogia,' 1668.] We may mark the rise of Change-ringing in Cambridgeshire, then, by the improvements in the Bene't peal from 1607 to 1615, by the making of Great S. Mary's four into five in 1611, &c., &c., but more conclusively from the general fact that 18 per cent. of the bells now existing in the county were cast in the early half of the seventeenth century. Among the benefactors of this age we may reckon Sir Thomas Sutton, the founder of the Charterhouse, who gave

> 'To the Parson and Churchwardens of Balsham, for the time being towards the buying a Bell, to be hanged in the Steeple, to amend the Ring there, 20 li.'" [Stowe's "Survey," ed. 1618.]

So much for Mr. Raven's account of the wild jangling in the "Golden Days of Good Queen Bess," and the subsequent improvement in bell-ringing.

I would now introduce one who was the most celebrated composer and ringer, and under whose superintendence and management the "Ancient College Youths" made the greatest progress during the first half of the last century: I allude to Benjamin Annable. Relating to this remarkable man the following paragraph appeared in the *Public Advertiser* of Monday, February 9, 1756:—

"A few nights ago was buried under the Tower of St. Bride's, Mr. Benjamin Annable, the best ringer that was ever known in the World. Till his Time Ringing was only call'd an Art, but from the Strength of his great Genius, he married it to the Mathematics, and tis now a Science. This Man in Figures and Ringing was like a Newton in Philosophy, a Ratcliffe in Physic, a Hardwicke in Wisdom and Law, a Handel in Music, a Shakespeare in Writing, and a Garrick in Acting. O rare Ben!"

This is, indeed, "coming out strong." However, to quote Mr. Raven once more, "a mourning peal was rung for this worthy man in Great-St.-Mary's Tower, Cambridge:" and I doubt not the same thing was done at many other churches in our "bell ringing island."

THOMAS WALESBY.

LONDON TRAMWAYS.

Last week saw the commencement of the construction of the tramway, in the East of London, authorised in the last session of Parliament. This is, we believe, the first breaking of ground for this purpose since Train's trams were removed in Westminster and the Kennington district. The new line, which will be double, has 4-in. rails, level with the roadway. The rail proper is smooth and on the outside of the surface; then a groove for the reception of the flange of the wheel intervenes: the inner surface of the rail is corrugated to afford foothold for horses. The rails are laid upon longitudinal sleepers, of Baltic timber, 6 in. deep by 4 in. thick; these are laid upon Portland cement, and are kept at equi-distance by cross ties of iron, about 1¼ in. by ¾ in., which are bound to the cast-iron shoes in which the rails are laid. Mr. Hopkins is the engineer of the line, Mr. Page, resident engineer, and Messrs. Fisher & Parrish, the contractors, with Mr. M. W. Anderson as their managing overseer.

CESSATION OF WORKS IN PARIS.

We learn by a letter from Paris "That the authorities there are about to enter upon a system altogether opposed to that of the last fifteen years. After having built outrageously, they are now going to do nothing, and will hardly finish the works already begun, at least in Paris. The Opera 'drags its slow length along,' and the Hôtel Dieu, which it was intended to complete at the same time, does not proceed more rapidly."

It does not appear whether this sudden change proceeds from financial or political considerations. But, perhaps, the recent conduct of the *classe ouvrière*, in regard to the election of candidates personally hostile to the Emperor, may have disgusted him.

SCHOOLS OF ART AND OF SCIENCE.

The Newcastle-under-Lyne School of Art.—The annual meeting of the friends and supporters of this institution has been held at the Town-hall, and was, as usual, well attended. The chair was taken by the Rev. E. J. Edwards. The walls were adorned with the principal productions of the students, and although there were fewer of the works in the elementary section than usual shown, the drawings which were exhibited were as a whole of a better class than on any former occasion, and reflected credit upon Mr. Bacon, the head master, as well as upon the students themselves. They included outline drawings from flat examples, outline drawings from the cast, shaded drawings of ornament from the flat and from the cast, flower-painting from the flat and from nature, shaded drawings from the cast of figure, painted monochrome from the cast in oil, and designs for the decoration of porcelain. The last-named should, perhaps, take the first position as regards excellence, the student who produced the designs (W. P. Rhodes) having, as the reports showed, obtained a medal in the national competition, and also been honoured with a national scholarship as an art student. The report of the committee, which was read and adopted, stated that as far as the success of the school was concerned this year in competition, the committee had every reason to be satisfied. The report of Mr. J. P. Bacon, head master of the school, was also read and adopted. It stated that the attendance in the classes and the progress of the students had been satisfactory. In the month of March the annual examination was held. Twenty-four students were examined; thirteen passed satisfactorily; and one obtained a prize. All the drawings finished in the school during the year are required by the Department of Science and Art, to be sent to London in April for examination. At the first or separate examination the works of sixteen students were satisfactory, four obtained prizes, and one honourable mention. The chairman distributed the prizes. The meeting pledged itself to support the school.

The Bristol School of Art.—The distribution of the Government prizes and certificates awarded to the pupils of this school has taken place in the large hall of the institution. There was a numerous and influential gathering. Mr. S. Morley, M.P., occupied the chair. In opening the proceedings, Mr. Morley expressed his deep conviction of the importance of institutions like that, and said he hoped soon to see an arrangement which would secure the education of every child in Great Britain. But the object of that institution had a special reference for those who needed what had recently been known by the term "technical education,"—an education that shall adapt them for the future occupation that may lie before them, and in connexion with which their power would be greater in securing an honourable maintenance for themselves. He was quite unconscious of being in any sense an alarmist, but he confessed he looked with a great deal of anxiety to the commercial future of this country; he believed they needed to pay attention such as they had never yet paid to the precise objects which their schools of art and science were seeking to secure. They needed cultivated workmen; and when he referred to the working class, he believed that the sons of our manufacturers, and those aiming to be foremen in the various manufactories equally needed cultivation in the race upon which they were entering. Nevertheless, he believed that England, at the present time, distinctly held h r own; but with the prospect, he hoped, of a large disarmament on the Continent, there would be a large addition to the force of labour brought into the labour market. They would have to look very keenly at all those points in connexion with which they were exposed to competition and difficulty, and he was therefore present to press upon all who had influence, whether manufacturers or occupying positions among the poor, who by a little kindly help or suggestion might be induced to avail themselves to an extent that had never yet been witnessed, of the power ready at their own hands, upon certain conditions. Two students of the school had obtained Queen's prizes; twelve had their works selected for national competition; and many prizes and extra prizes were gained by others among the students.

The Oxford School of Science and Art.—Evening classes in several scientific subjects have been formed, numbering in all some seventy or eighty students. The present arrangements include Building Construction and Drawing, Animal Physiology, Elementary Mathematics, and Inorganic Chemistry.

The Birmingham School of Art.—The usual meeting of the Art Students' Literary Association has been held in the Reference Library of the school, Mr. C. E. Emery, chairman. The business of the evening consisted of a selection of readings from art works. Mr. Jenks's selection was from "Dresser's Art of Decorative Design," on the "Power of Ornament to Express Feeling." Mr. C. B. Agnesse's readings were "Selection from Ruskin" and the "Rev. E. Young on Pre-Raffaelitism," comprising the thoughts of the two authors on the subject of historical painting. A discussion followed each of the readings.

The Cambridge School of Art.—The annual distribution of prizes to the successful students in this school took place in the small assembly room, Guildhall, on which occasion the room was filled to overflowing. Professor Lightfoot occupied the chair. Mr. W. M. Fawcett (hon. sec.) read the report, which said:—

"The committee had to congratulate the students and friends of the School of Art on its continued prosperity. The success on the Government examination, and in prizes awarded by the Government for works done during the year, has been greater than for several years past.

Thirteen have this year received third-grade prizes, against six last year.

Two have been honourably mentioned, five having been last year.

Ten have received second-grade prizes, against six last year.

Forty-one have received certificates of having satisfied the examiners, against twenty-eight last year, and one free student has been elected, against two last year.

The names of these prize-holders will be announced when the prizes are distributed."

Mr. F. T. Palgrave afterwards read a paper on "The Practical Laws of Decorative Art."

The Salisbury School of Science and Art.—The annual distribution of prizes to the pupils of this school took place at the Council Chamber, in the presence of a numerous and influential assembly. The Bishop of Salisbury presided. The Rev. R. G. Swayne read the report, which said, as to the progress of the school:—"It has now been at work for more than four years; for nearly the three last of these under the present master, Mr. Fraser, and the results attained have fairly answered the expectations formed. The number of students at the evening classes, who are, almost without exception, young men and lads, the sons of tradesmen and artisans, is at present 31; that of the day classes, 22. During the summer and winter sessions of this year 46 students in all have attended the evening classes." There were 13 successful competitors for the prizes, which were distributed by the bishop, after which appropriate resolutions in support of the school were passed.

The Frome School of Art.—The presentation of the Government prizes to the successful pupils of this school has been made by the Marchioness of Bath. There was a numerous attendance. The school has got new and spacious premises in the literary and scientific building. The Rev. Prebendary Horner, the president of the school, was in the chair. In course of his address he said he was glad to state that they had better prospects of success than they ever had before. They had had, as they knew, a great deal of trouble arising out of a change of masters. The school, in consequence, went down, and the committee were in the utmost perplexity. However, they succeeded in obtaining the services of a gentleman, whose careful attention to the school and every pupil in it had re-established their school; and now that they had a fitting place to meet in, and a very good master, they hoped they were entering on a prosperous way. In the evening there were forty-six pupils, all of the artisan class, besides twenty-six morning pupils; and twenty of the artisan class attended the science class. The result of the examination held here was that 480 works had been sent up to London—which in itself was good proof of Mr. Goepel's activity, for last year they had only 360. Thirty-four of their pupils had passed the examination, and thirteen had obtained prizes, while three had full certificates in all the grades. It should be remembered that this was in a competition wherein 50,000 or 60,000 specimens were sent in. Moreover, one of their pupils had gained a scholarship of 50*l.* a-year at Kensington; and they had been paid for twenty-three pupils, as against thirteen last year. This showed the interest taken in the school by the artisan class,—the class they hoped to do so much good for. Science and art ought never to be separated, and therefore it was he was glad to see that twenty of their pupils had been examined in science.

FROM SCOTLAND.

Carlaverock.—The publishing firm of Messrs. A. & C. Black have just done a kindly deed to mark the spot where rest the remains of Robert Paterson, the "Old Mortality" of Sir Walter Scott's novel, a deed similar to that of the great wizard himself, when he caused to be erected in the churchyard of Irongray, stewartry of Kirkcudbright, a tombstone over the resting-place of Helen Walker, the prototype of Jeanie Deans. The venerable renovator of the tombs of the Covenanters, in the last of his peregrinations at his hallowed work, was in the neighbourhood of Bankend, parish of Carlaverock, about eight miles from Dumfries, when he was seized with illness, and was found on the roadside. He was removed to a friendly house, where he died in a few days, and was interred in the churchyard of Carlaverock. No stone marks the spot where he reposes; but the particular place is known. Messrs. A. & C. Black recently gave orders that a monument should be erected over Old Mortality's grave, and with good taste directed that the memorial should be in keeping with the simple taste of him it was designed to commemorate. In accordance with Messrs. Black's instructions, Mr. Thomas M'Meekan, monumental mason, Dumfries, has finished a headstone of red freestone, and which has been placed in Carlaverock Churchyard. The stone has a circular top, with a beaded moulding. Near the upper part a mallet and chisel, crossed, are cut in relief, and underneath is the following inscription:—

ERECTED
TO THE MEMORY
OF
ROBERT PATERSON,
THE
OLD MORTALITY
OF
Sir Walter Scott,
WHO WAS BURIED HERE,
February, 1801.

Why seeks he with unwearied toil
Through Death's dim walls to urge his way,
Reclaim his long arrested spoil,
And lead oblivion into day?

Perth.—Workmen have been taking down an old house in the Watergate, for an ingress to the Free West Church, which is to be built in Tay-street. The house in question, says a local paper, is, without doubt, one of the oldest, if not

the most ancient house in the town. It had a wooden front, which hid the massive wooden work behind. Judging from its style of architecture, the house must have been built either in the twelfth or thirteenth century. The architecture is the Early Scottish, approaching to the Norman. As originally built, the house had on the ground floor three circular archways, which served either for doors or windows. The arches were built of ashlar-work, and were faced in front with two large polished stones meeting in the centre. On the ground-floor there are no windows to the back. The town houses of the higher class, down to the sixteenth century, had balconies in front, and so had the one taken down in the Watergate. According to tradition, the house was, at the time of the Reformation, occupied by Mr. Patrick Murray, whose son, as John Knox states, was killed when the queen regent and a portion of the French army entered Perth, on May 29th, 1559.

Books Received.

Marvels of Glass-making in all Ages. By A. Sauzay. Illustrated. London: Sampson Low, Son, & Marston. 1870.

THE marvels of glass are great and innumerable. The transparency whereby to the eye alone this hard and solid substance seems as if it had not even fluid or aërial, far less solid existence, is not the least of its marvels. By its telescopic arrangements, we see into otherwise impenetrable space, and bring invisible worlds into sight. By its microscopic forms, we bring up out of the invisibility of minuteness, new worlds of being and of life as far beyond our limited sight as are the star-dust suns and worlds with which it shows us that the firmaments of heaven are strewed. Even yet its marvels are on the increase. By the spectroscopic prism we now can see infinitesimal traces of substances where before not a ghost of them could be seen; and can identify the existence of known elements of earth in the sun, and even in the wisps of hydrogenous nebulosity which form the far-off background of the firmamental sky.

The marvels with which the work under notice chiefly deals, however, are marvels of another kind, such as forms of art; and many of these are not only described, but beautifully illustrated by autotypes and wood engravings. The chief interest of the book in any one subject may be said to be centred in goblets and drinking-glasses, many fine examples of which are illustrated. Next in interest come glass-cutting and engraving, with more illustrated examples. Then there are elaborate mirrors and looking-glasses, to which other arts lend their aid. The colouring of precious stones, and the formation of false pearls, the marvels of spun glass, iridescence of glass, water-glass, optical glasses, lighthouses, and various other cognate subjects, are also treated of; as well as the composition of glass itself, and the processes of its manufacture, both as a raw material and as a work of art. These, with an introduction and an alphabetical index, pretty well exhaust the work as a treatise.

The author is not quite correct in all his statements. He states, for example, that soluble glass was invented in 1825 by Dr. Fusch, of Munich, who called it water-glass; whereas soluble glass was well known of old,—it is hard to say how long,—under the name of "oil of flints."

We may here quote the recipe for making water-glass given by M. Sauzay:—

"Soluble glass is obtained by melting in a refractory crucible a mixture of ten parts of potash, fifteen parts of quartz finely pulverised, and one part of charcoal powder. When it is melted, the glass is cast: it is afterwards pulverised and treated with four or five times its weight of boiling water. A solution is thus obtained, which, applied to other bodies, dries rapidly in contact with the air. Let skilful workmen take up this idea and perfect it."

The less quartz there is, we may here note, or the more potash, the more apt will the glass be to be affected by damp, or even to deliquesce. It may be a question, therefore, how far pulverised quartz may be incorporatable with the already formed glass, as a paste, after its basis has been got by furnace or other heat. Spread on a wall, for example, in solution, with a brush, a powdering with finely-pulverised quartz, would probably convert even weak or deliquescible water-glass into an anhydrous substance no longer affectable by damp.

The remarks on spun glass are curious and interesting. We dare say it is not generally known that at one time not only were glittering dresses of a mixture of silk and spun glass worn, as well as aigrets for ornamenting ladies' bonnets, which waved about with the lightest breeze, but "the flowing black curls, which, when worn by a prince, became the admiration of all Paris, were likewise made of spun glass, curled with irons." Here is your material, ladies, for no end of "golden hair," and without fear of natives inhabiting it, or obligation to natives who reared it and perhaps died with it still on their heads. In the Conservatoire des Arts et Métiers at Paris, it seems, in the glass-room there is a lion of life-size "with splendid hair and bristling mane," whose capillary attractions are all of spun glass, which, by the way, is truly capillary or tubular, just as real hair is, and can even be filled with mercury by help of an exhausted receiver.

The publishers merit a little compliment for the way in which they have got up M. Sauzay's volume.

Art in England. Notes and Studies. By DUTTON COOK. London: Sampson Low, Son, & Marston. 1869.

THE title of this little book is too large, and, moreover, will keep off buyers; for many, if they knew that the volume simply consists of a number of pleasantly-written papers about artists and art-doings, might in this age of careless reading be disposed to look to it who certainly would give no thought to the study of "Art in England." The headings of some of the chapters will better show the nature of the book:—"Mrs. Hogarth and her Lodger" (Alex. Runciman); "George Romney"; "The Story of a Scene-painter" (Loutherbourg); "Sir Joshua's Pupil" (Northcote); "The Pupil of Sir Thos. Lawrence" (Harlow); and so on. An interesting paper on that very indifferent man and wonderful artist, Turner, closes the volume, which is instructive as well as readable.

The Lord's Prayer Illustrated. By F. R. PICKERSGILL, R.A., and HENRY ALFORD, D.D. London: Longmans, Green, Reader, & Dyer. 1870.

DR. ALFORD, in his preface, says Mr. Pickersgill's designs were submitted to him during the last autumn, with a suggestion that he should connect them together by writing some letter-press in accordance with the leading idea of the artist. It seemed to the dean, however, that this idea would be most clearly brought out by throwing the illustrative text into a poetical dramatic form, and he has accordingly, in a charming poem, entitled "The Children of the Lord's Prayer," developed at once the meaning of the artist and the spirit of the words which enter into the daily prayer of all Christians. Parts of the poem are of the highest order of merit, and will live. Mr. Pickersgill's designs are nine in number, and are characterised by great breadth and beauty. We should especially point to the first, "Our Father which art in Heaven;" and the third, "Thy Will be done on Earth as it is in Heaven." The drawings are engraved with great skill and excellence by the Brothers Dalziel. With beautiful print, paper, and binding, this book is not for 1870 alone, but for a long string of years after.

Mottoes and Aphorisms from Shakspeare. London: James Hogg & Son.

THE wonderful wisdom and variety of Shakspeare is well shown by this little book, wherein, with more trouble and pains than some would suppose involved, "T. E. J." has set forth 2,700 mottoes and aphorisms culled from our great bard's works. They are all brief,—two or at most three lines each,—are ranged alphabetically, and made further available by a copious index of words and ideas.

The World of Wonders. London: Cassell, Petter, & Galpin.

A BOOK better adapted than this to open the mind of the young to a perception of the wonders of nature, science, and art, we do not know, while as a half-hour's reading-book for all, to be taken up and put down again, it affords unending resource. Truly, as Coleridge says,—"In wonder all philosophy began, in wonder it ends, and admiration fills the interspace; but if the first wonder is the offspring of ignorance, the last is the parent of adoration."

VARIORUM.

WE have before us a number of Letts's popular Diaries for 1870; some a shilling each, one sixpence. They include a variety of useful information, and will meet the wants of a large class. The "Appointment Diary" gives the means of entering engagements for every hour. The Medical Diary is extremely portable, and well suited for the purpose intended. It gives an opening of two pages to each week, the left hand being divided into the days of the week, the right equally applicable to daily entries, but arranged more especially for lists of patients. The Large Print Almanac is specially prepared for dark offices and short or aged sight. The days of the week and month are printed in bold black type, so as to be promptly legible where ordinary calendars would be useless. We must add a word of recommendation for the gummed labels (250 for 3d.) issued by the same firm. They will be found very handy for many purposes.——"Gutch's Literary and Scientific Register and Almanack" for 1870 is literally crammed full of all sorts of information.——"Dietrichsen & Hannay's Royal Almanack" holds its own.——The Christmas number of the Publishers' Circular is full of specimen engravings from new illustrated works, which give it a special value.——Mr. J. W. Anson's "Dramatic and Musical Almanack" includes a notice of the fall of the Brunswick Theatre in 1828, "Saunterings in Southwark," and notes on "the difficulties experienced in building the Victoria Theatre."

Miscellanea.

The Glasgow City Improvement Scheme. Down to the date of their last report the trustees had expended in purchases, &c., 565,016*l.*, including 25,000*l.* paid for ground to form the new park for the north-eastern district of the city. Against this expenditure, there had been borrowed 462,980*l.*, the assessment having yielded an additional sum of 92,923*l.* The purchases are scattered over most of the areas intended to be operated upon, and comprise a population estimated at 20,000. In some cases nearly the whole of the property required has been secured, while in others considerable purchases yet remain to be negotiated. Speaking generally, the greatest progress has been made in the most necessitous localities; that is to say, in areas adjoining the High-street and Saltmarket, in Gallowgate, and in the Main-street of Gorbals. The new park is on the lands of Kennyhill, on the banks of the Monklands Canal, about a mile eastward from the Cathedral. For twelve months past the park has been in course of formation, and now a considerable portion of the grounds is open for public resort. In conjunction with Mr. Dennistoun of Golfhill, whose property adjoins, the trustees have made arrangements for laying out a suitable approach. The carrying out of this design, while obliterating numerous eyesores, will result in the establishment of a noble thoroughfare, which cannot fail to improve the general character of the Townhead district. With regard to the future action of the trustees in the direction of reconstruction, nothing has been positively decided on; but it is expected that a beginning will be made in the course of a few months. Of their extensive operations, the trustees' committee would seem to have pitched upon two as specially eligible for speedy execution. One of these is the extension of Ingram-street eastward to the College, and the other the continuation of Bell-street through the district north of Gallowgate. In each of the areas in question, the trustees have acquired nearly all the necessary property. Mr. Carrick, the city architect, is the practical adviser of the trustees.

Columbia Market.—It is stated that the Artisan and Labourers' Dwellings Company (Sir Sydney Waterlow, chairman) are in treaty with Miss Burdett Coutts for a long lease of a portion of her vacant land, outside the market, and near Shoreditch Parish Church, with a view to erecting buildings of a cost value of 20,000*l.*, to be completed by the close of the year 1870. Other building negotiations are in treaty, and the approach to the market, nearest to London, is being widened to the fine extent of 50 ft. The iron columns for the covering of the Market-square are already cast, and Messrs. S. C. Hemming & Co., of Moorgate, will, early this week, commence to roof in, preparatory to the opening of the Market-square, as a great wholesale fish-market, some time in January next.

The Drains and the Habitability of a House.—In the Court of Queen's Bench, Westminster, on December 10 (sittings at Nisi Prius, before Mr. Justice Mellor and a special jury), the case of Davies *v.* Remmett was concluded. It was an action by a gentleman against the landlady of a furnished house at 24, Queen's Gate-terrace, South Kensington, for letting it to him in a state unfit for occupation, by reason of the drains being in such a bad condition that they gave rise to foul air, which rendered the house unwholesome and uninhabitable. The case lasted nearly three days. It came out in the course of the defence that the traps to one of the drains had been mended carelessly (with cement instead of solder), and it also appeared that there was a hole in one of the traps. The jury had had a view of the house. Sir J. Karslake, upon the part of the plaintiff, put the case upon the ground of an implied warranty, and cited the recent case of "Campbell *v.* Lord Wenlock," 4, *Foster and Finlaison's Nisi Prius Reports*, as supporting that view. Mr. Serjeant O'Brien, on the part of the defendant, the landlady, denied the alleged warranty, and appealed to earlier cases where it had been doubted. The Judge said he should abide by the recent case, where the point had been distinctly ruled. The jury, at the close, requested a physician's certificate to be read, in which it was said:—"My attention has been called to the state of the drains from my own observation. We could smell the drains. It might be from a sink, but I satisfied myself that it was from the drains. Such smells would not originate fever, but would tend to aggravate the symptoms." After being absent a great part of an hour, the jury returned into court with a verdict for the defendant, the landlady.

Charge of Conspiracy against Master Brickmakers.—Thomas Hayes, Francis Gregory, and Enock Bowker, were indicted at the Manchester Assizes, on Tuesday, before Mr. Justice Willes, for conspiracy, inasmuch as being members of the Brickmakers' Associations they conspired to refuse a supply of bricks to the prosecutor, a bricklayer, for the completion of a particular work. The defence was, that bricks had been supplied for the same building to a contractor who had failed to pay for them. Defendants then refused to supply more bricks until the others had been paid for. Mr. Justice Willes said, if one man supplied bricks to build a house it would be lawful, and if, having supplied bricks, he refused to supply more till those were paid for, it would be justifiable; but if three persons combined to do the same thing did it become unlawful? Mr. Leresche, counsel for the prosecution, thought if a number of persons combined to coerce a man to pay a debt which was not his own, by not supplying bricks, it would be wrong. Mr. Justice Willes.—Is coercion wrong, except in the abstract? Mr. Leresche thought so. Mr. Justice Willes.—It appears to me that it is not. Coercion by illegal means is wrong, but coercion by legal means is right. Mr. Leresche quoted a number of cases more or less supporting his view of the case; but the learned judge said he was well up in all these points, and counsel's reasons had no more effect on him than a shower of rain would have on a duck's back, the rule of law being quite clear to his mind. He suggested that the prosecution should be withdrawn on both parties agreeing to take no further proceedings. This was agreed to, and Mr. Justice Willes directed the jury to find a verdict of acquittal, in which they acquiesced.

Society for the Production of Art Books. In Paris a society has been established, under the title of Société d'Encouragement pour la Propagation des Livres d'Art. Its object is to favour the publication of books calculated to spread a knowledge of and taste for art. The seat of the society is at Messrs. Goupil & Co.'s, Boulevard Montmartre. M. Daviound, architect to the city of Paris, is the president, and the committee includes other architects, painters, and sculptors.

The New Street by the Mansion House At the last meeting of the Metropolitan Board of Works it was decided that the name Queen Victoria-street be applied to the new line of street from the Thames Embankment to the Mansion House. With all our loyalty, we cannot applaud the Board for their decision. There is already a Victoria-street hard by (the continuation of Farringdon-street), not to speak of Victoria-street, Westminster.

Rome, the City of Dirt.—A correspondent of the *Times* says, with equal force and truth:—I do really believe that the Pope and his people far surpass the efforts of ordinary national proclivities in their zeal for their place, their city, their temples, and their throne. But what churches, what domes, what columns, what statues, what marbles, what mosaics, what paintings, what tissue of gold, what jewelled tiaras, what processions of cardinals and bishops from all the world, what candles and lamps, what guns and bells, what fountains shooting upwards or running down, can make up for dirt, dirt, dirt, as ubiquitous always as the plagues of Egypt were for one dreadful hour or so? Whatever else this is, it is a city of dirt, and whoever tries to change the air by a stroll into the suburbs only finds them a good deal filthier than the city itself. And this is the State which proposes to lay the greater part of the civilised world under terrible curses, unless it will receive some mysterious dogmas on the most inscrutable subjects, and be also content to repose on her infallible judgment upon any political, social, or economic question that may happen to divide society! We may not tell the physician first to heal himself, but we request him, at least, to clean himself [since "cleanliness is next to Godliness"] and to establish some claim to teach us mysteries by a little improvement in matters cognizable to bodily sense.

A Town Swallowed by an Earthquake. The *Impartial* of Smyrna gives an account of a frightful catastrophe. The town of Oula, in the district of Mentéché, a dependency of Aidin, has disappeared,—entirely swallowed up in the earth after three successive shocks of earthquake. The inhabitants were to some extent warned of what was about to occur by dull rumbling and alarming sounds, which were soon followed by a first shock that made them fly terrified to the neighbouring hills. Except three persons, therefore, all the inhabitants escaped with their lives. Marmaritza and Moula, in the same district, have also suffered severely. The governor *ad interim* has sent provisions, tents, and money to the unfortunate people, who are thus left without a roof, or even the common necessaries of life. This extraordinary persistence of earthquakes in divers places is getting serious. The worst of it is that if Professor Phillips, the geologist, be right in thinking, as he is said to do, that a period of recurring activity in the disturbing causes which affect the earth at great intervals of time has commenced, a long continuance of them may at least be anticipated, if not an increase in their intensity, beyond their mere initial action.

Flint Arrow-heads in Egypt.—Messrs. Hamy and Lenormant write to the Académie des Sciences to prove that Egypt has had its age of stone as well as Europe. Their letter is dated from Luxor, and they say:—"The existence of an age of stone in Egypt has often been the subject of controversy. The facts we are about to relate will, we think, give some information that will exercise an influence on the opinions entertained hitherto on the question. On the elevated plateau which divides the celebrated valley of Biban-el-Moloak from the escarpments which overlook the Pharaonic edifices of Deir-el-Bahari, we have ascertained the presence of an enormous quantity of wrought flints, lying on the surface of the ground, to the extent of upwards of a hundred square yards. These wrought flints, which are of the well-known type designated arrow-heads, lance-heads, lanceolated axes, knives, scrapers, &c., evidently constitute the remains of an ancient manufactory, according to all probability pre-historic, and exactly resembling those known in France under the denomination of 'Factory of the Neolithic Period.'"

The Ceiling of the Paris Opera House.—A curious account is given of the ceiling of the new Opera House in Paris. It will be composed, we are told, of a vast number of plates of copper screwed one to another in such a way as to be easily put together and taken to pieces again. Part of the advantages of the plan is said to be that the ceiling can thus be raised or lowered at will. The whole is divided into several sections, which are now being painted with allegorical representations of the hours of day and night, more than a hundred figures being included in the whole. The place in which M. Lenepveu, the artist, carries on his labour is situated in the grand cupola over the pit, and forming an immense rotunda, 120 ft. in diameter and 65 ft. in height.

Gasometers Blown Down.—At Cambridge, during a recent gale, the largest gasometer in the University and Town Gasworks was capsized and the gas was set fire to, although there was no light within thirty yards of the gasometer. No explosion occurred, but the immense flame caused a fire on the premises. As so often and so curiously happens by coincidence, a gasometer was shortly thereafter blown down at the Gloucester Gasworks. It had been recently erected, at a cost of nearly 4,000*l.*, and was capable of holding 240,000 ft. of gas. One of the chains gave way, then another, and while the gasometer was descending an iron pulley broke a hole in the top of it, and the gas all escaped. There was a light near, but no explosion nor firing took place. As such accidents not unfrequently happen, more care ought to be taken in the steadying of such enormous and top-heavy structures as large and filled gasometers, which cannot, in such cases, have any fixed basis on which to rest, and must naturally tend, like balloons, to wabble about, even though made and weighted with iron. The giving way of chains under such circumstances might well be anticipated, and ought in some way to be obviated.

Extraordinary Scene in a Church.—On Sunday, the 5th instant, the inhabitants of the village of Horndon-on-the-Hill, according to the *Chelmsford Chronicle* of 17th December, were thrown into a state of great excitement in the church during divine service, when a very strong sulphurous smell spread over the edifice. It was with difficulty the vicar was enabled to continue his sermon on "The evidence of things not seen," towards the close of which the school children, who were seated beneath the belfry and near one of the stoves, began to be much affected. Some vomited, others fainted, and had to be carried out, causing no little commotion. The congregation now began to find that the fumes from the coke of the church stove, instead of being conveyed up the chimney, were beaten down into the church, caused by a heavy atmosphere and a defect in the flue, thereby checking the necessary draught. Several ladies, upon leaving the church, inhaled the vapour, and were thrown prostrate, some were attacked when coming in contact with the air, while others were able to reach their destination before feeling the ill effects. Upwards of thirty people were more or less victims to the carbonic and sulphurous vapours. Fortunately no one was fatally affected.

Wolverhampton.—At Wolverhampton the Great Western Railway Company have established extensive works for the building of their large engines, the manufacture of railway fittings, and other purposes. The works are under the superintendence of Mr. G. W. Armstrong, and employ altogether upwards of 2,000 men and boys, for whose mental improvement a commodious lecture-hall, reading-room, and library, are provided. The Stafford-road Institute, as it is called, is not only supplied with the principal daily and weekly newspapers, and books of an entertaining character, but care is also taken to provide for the use of the members the best magazines and periodicals on mechanical and scientific subjects, diagrams, &c., such as will prove advantageous to them in connexion with their daily employment. Lectures are also delivered ocasionally; and on the 9th inst., Mr. C. Manton, architect, delivered a lecture on "The Architectural Antiquities of Athens,"—the subject of the lecture being illustrated by a number of panoramic views (each view occupying a space of 12 square feet of canvass) painted by the lecturer.

A Universal Telegraph.—Mr. T. W. Tobin, of the Royal Polytechnic Institution, is said to have invented a telegraph without a battery, so that we cannot call it an electric telegraph. It simply comprises the usual wires and two terminal discs, indices, and semaphores, with two boxes, the contents of which would seem to be a secret at present, but which, of course, must contain no electric batteries. Not being as yet in the secret, and not, therefore, being bound to secrecy, we are free to guess or suggest what it may be; but all that we can suggest is that unless it be a magnet that is contained in each box, we must "give it up."

A Statue of the late Earl of Dundonald. Considerable funds have been raised for a statue in Valparaiso to the great naval hero, Lord Cochrane, whose merits, like those of Admiral Napier, we have not yet fittingly acknowledged in this his native country, although tardy justice was done to the maligned reputation of Lord Cochrane.